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REPORT OF DEMONSTRATION
FARMS AND SCHOOLS
OF AGRICULTURE OF THE
PROVINCE OF ALBERTA



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DEMONSTRATION FARMS
and
SCHOOLS *of* AGRICULTURE
of the
PROVINCE *of* ALBERTA



Issued Under Direction of the
HONORABLE DUNCAN MARSHALL
MINISTER OF AGRICULTURE



HON. DUNCAN MARSHALL, Minister of Agriculture

Agricultural Education in Alberta

IN presenting this, the first report, which includes both Schools of Agriculture and Demonstration Farms, we have endeavored to give a summary of the work done in each of the branches during the past year. This makes complete, in so far as it concerns the three farms upon which schools have been erected, the system of instruction in practical agriculture and household economy for boys and girls in Alberta. Several members of the staff of the Provincial Department of Agriculture have contributed articles to this report on subjects with which they are familiar, the idea being to make this not only a report, but also a useful bulletin for the information of farmers in the province, who desire to follow some of the different lines of farming that we are endeavoring to carry on in connection with the Demonstration Farm work.

Like every other farmer who has begun operations on anything like an extensive scale in this province, we have found that it entails a great deal of labor, and considerable expenditure, to take a raw farm, with wages as high as they have been in the last few years, and get it in full operation; and some of the experiences of officials of the Department of Agriculture in actually working out these problems on the land have given them a great deal more information regarding the difficulties that a man on the land has to solve than they ever could have obtained in any other way. The problem with which a Government farm is confronted is that every move that is made upon the farm in the way of improving it, bringing more of its land under cultivation, adding anything to its buildings, or doing the thousand little things that are necessary in developing a farm, has to be paid for in hard cash; and when it is recognized that the average profits in farming today do not represent much more than wages for the farmer, his wife, and family, who work on the land, with the added advantage to them of making and owning a home, we are rather well satisfied with the cash receipts, as well as with the increase in live stock that has been produced, when we consider that a large percentage of the land in these farms has not yet been brought under cultivation.

The result of this, the first year of the Schools of Agriculture, has gone a long way to demonstrate the success of the whole scheme. There can be no doubt about the fact that if you are going to train boys to farm, a great deal depends upon the environment that surrounds their agricultural education. Our Schools of Agriculture are conducted in connection with a farm such as any of the boys attending may have an ambition to build up for himself during his life time, and the whole surroundings of the school are such that the business of farming is kept to the front, that the boys

see the actual results of the handling of good dairy cattle, the raising of hogs, the feeding of beef cattle, and the conduct of other lines of mixed farming. The dignity of agriculture and the importance of the man on the land, not only to the community but to the Province and country, is a gospel that is incessantly preached, and there has been aroused in each class at each of the schools an enthusiasm for intelligently directed scientific agriculture that is bound to mean a great deal to future farming in Alberta.

The very fact that the environment of the school is a farming environment has induced many boys and girls to attend who, because of their lack of even a good public school education, could not have been induced to attend any other kind of educational institution; in fact, the meagre educational qualifications that they possess would not permit them to attend any other educational institution. The result has been that over two hundred and fifty boys and girls in Alberta this year had an opportunity afforded them to improve their general education, as well as to get a special training in Agriculture and in Household Science. The probabilities are that nearly twice that number will attend next winter, and what this general education means to them and to the citizenship of Alberta is impossible to estimate. Important though agriculture is, it is of greater importance that opportunities for improvement and enjoyment in life should be given to these young men and women through these schools.

The records made with the several dairy herds in connection with the Demonstration Farms during the past year have been in many cases phenomenal, and these cows, having now become acclimated in Alberta (most of them were brought from the Province of Ontario), should make even better records this coming year. The dairy cow competition carried on in connection with the Demonstration Farm at Vermilion proved such a success that this year we are conducting three competitions—one from Vermilion, one from Olds, and one from Claresholm—as well as a pure-bred dairy competition which covers the whole Province. The enthusiastic manner in which a large number of the boys who attend the schools, as well as the great majority of the proprietors of pure-bred dairy herds in the Province, have taken up this matter, augurs well for its success. In fact, we owe a great measure of the success of the work of the Department of Agriculture, in all its ramifications in the Province, to the large sympathy and enthusiastic support that we have received from intelligent farmers all over the Province. They have been ready to co-operate in every way for improvement in the different lines of farming, and the work of the Department in connection with its Demonstration Farms, its Schools of Agriculture, and its Short Course Schools, has been one of co-operation with the farmers themselves, and through these institutions we are endeavoring to work out with the men on the land in Alberta the problems of successful agriculture.

Hundreds of farmers from different parts of Alberta have visited both the farms and the schools. Not only so, but men from every Province of Canada, from Quebec west, have paid special visits to these Schools and

farms during the past year, and the personal expressions of satisfaction at the work we are endeavoring to do, and the resolutions passed by different farmers' organizations, such as the Provincial Fairs' Association, have been very gratifying indeed. The farmers of Alberta and the officials of the Department of Agriculture have taken such a personal pride and personal interest in these institutions as to make last year's work in connection with them not only a harmonious one but one that has been highly successful and exceedingly satisfactory.

We have by no means yet achieved the results at which we aim. It will take several years of very hard work upon the part of everyone connected with these institutions to bring them to a condition that will begin to satisfy the Department of Agriculture. They have entailed a great deal of labor, but they are worth it, and the aim of the Department is that these farms shall improve each year, both in their production of revenue, and in their usefulness to agriculture in the Province. More schools must be built before long. The demand for a better education made by the farmer's boy and the farmer's girl in Alberta must be met. The future operation of these institutions calls for more labor and more money, but if they are the means of imparting information to make life on the farm more satisfactory, and in any way more profitable, they are well worth while.

In connection with this educational work, the establishment of a Provincial Board of Agricultural Education has proven to be a very good move. The different members of the Board have taken a deep and active interest in both the establishment and the progress of agricultural education and agricultural development in the Province. They have taken great care to see that the course of study prescribed for the Schools of Agriculture should be of a most practical character, and the discussions of the whole question at the several meetings of the Board have been of very great value to the Department in many of its lines of work. Every member of this Board has a large and personal interest in the improvement of agricultural conditions in the Province, and is giving valuable service to the Province in his capacity as a member of the Advisory Board.

The different branches of work in connection with these institutions are dealt with more in detail in the several articles that appear in this publication, and many illustrations are given of the classrooms, the live stock, and other interesting features of the Department's work.

Duncan Marshall.



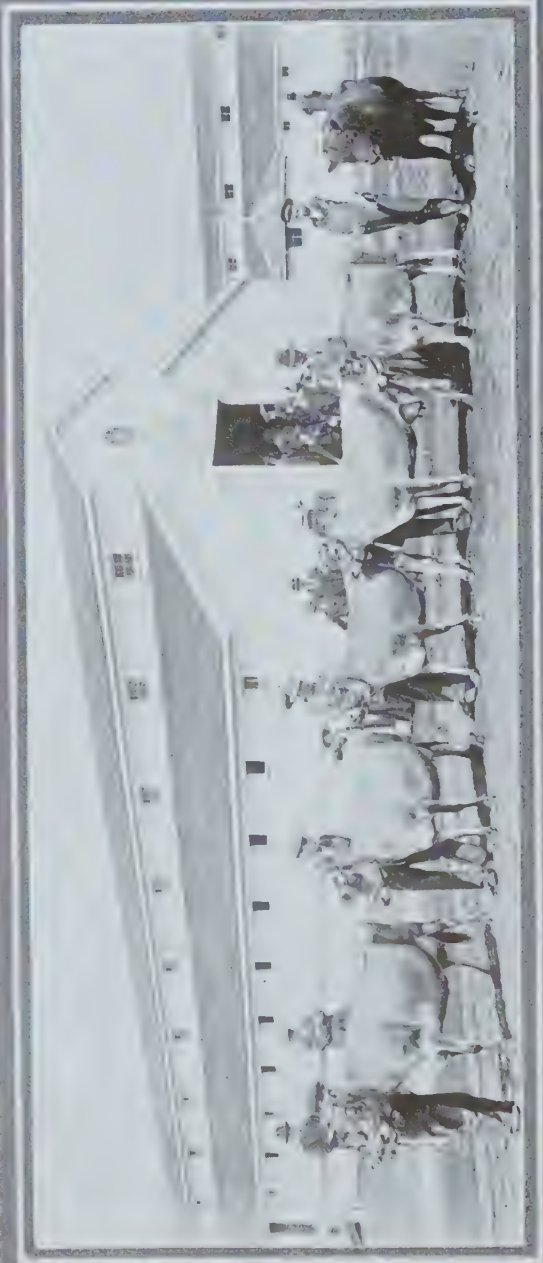
*Geo. Harcourt, Deputy Minister of Agriculture
S. G. Carlyle, Special Instructor, Dairy Farming
W. F. Stevens, Live Stock Commissioner*

*H. A. Craig, Supt. of Demonstration Farms
C. P. Marker, Dairy Commissioner
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J. Clements, Mgr. Olds Demonstration Farm
H. H. McIntyre, Mgr. Sedgewick Dem. Farm*

*A. Galbraith, Special Lecturer on Horses
G. Brown, Mgr. Medicine Hat Demonstration Farm
R. Fraser, Mgr. Stony Plain Demonstration Farm*



Jerseys from Medicine Hat Demonstration Farm

Ayrshires from Claresholm Demonstration Farm

Buying A Dairy Cow

IN buying a grade dairy cow it is seldom possible to secure any accurate information respecting her record, or that of any of her ancestry, consequently it is necessary to rely upon the indications of milking qualities as revealed in the conformation of the cow.

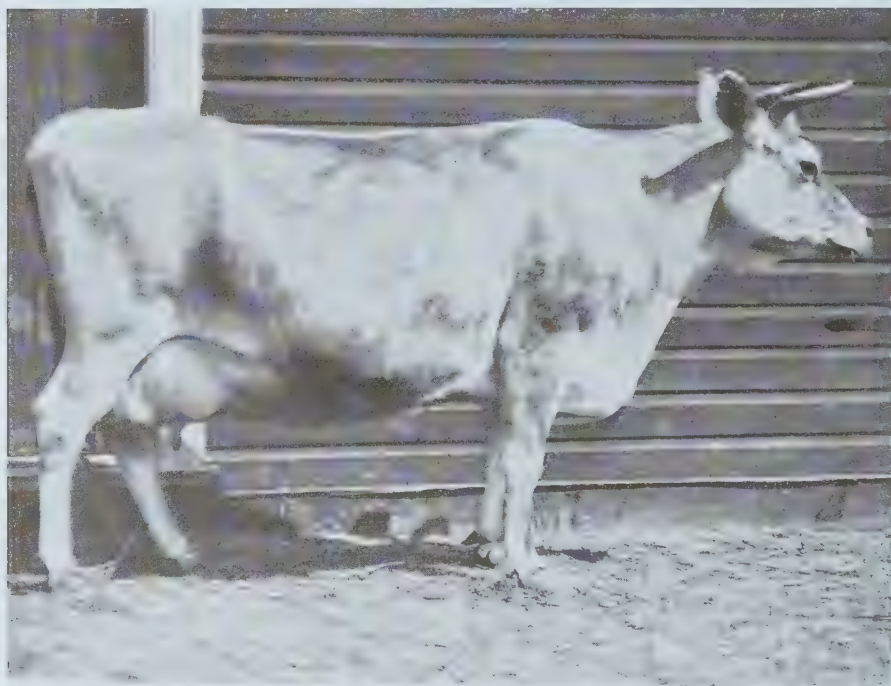
A glance over the records of the dairy cows at the Demonstration Farms cannot fail to convince one that the profit from a dairy herd depends very largely upon the selection of the cows in the herd. One of the grade cows gave 14,332 pounds of milk in nine months and ten days. Another cow in the same herd gave only 6,286 pounds in nine months, which, reduced to dollars and cents means that, one cow made a gross revenue of \$286.64, while the other made \$125.72, that is, taking the price of milk at \$2.00 per hundred. The first cow cost \$125.00 in Ontario, and the second \$65.00. In examining the records further it is found that the average production for 60 cows during the milking period of 1913 is 9,300.6 pounds, and the average for ten others for the same period is 4,174.35 pounds. With these facts in view the selection of cows for the herd should receive most careful consideration, and in setting out to buy, one should not be



A Pair of Grade Holsteins, Stony Plain Demonstration Farm

governed so much by the price which it is necessary to pay, as by the kind of individual which it is possible to secure, provided of course that the price is not unreasonably high. With the present price of milk and cream a good cow will soon make the difference between her cost and that of an ordinary cow.

There are many important points to be considered, but perhaps the first and most important is that of constitution. The strain upon the constitution incident to heavy milking soon begins to make itself felt unless the animal is possessed of that rugged form which enables her to withstand heavy strain without lessening vitality. In order to get this rugged conformation the animal must possess plenty of scale and substance, com-



"Christmas," a Jersey at Medicine Hat Demonstration Farm

bined with a full heart girth, and deep chest. Any depression immediately behind the shoulder or behind the fore-arm reduces the room for the vital organs, and consequently weakens the constitution.

Another important point to be looked for in choosing a dairy cow is capacity to consume feed, as indicated by the depth and length of barrel. In addition to this it will be found in cows that are heavy feeders, that they have large, clearly defined muzzles and large mouths.

Having secured constitution and capacity to consume feed, then look for quality in the cow. Coarse, rough conformation is generally accompanied by a coarse, heavy hide, and this kind of cow is invariably a light milker. The skin should be pliable and elastic, the hair fine and silky, the bone smooth and clean, and the whole animal should have a sweet, feminine appearance.



Milk veins on a cow that gave 16,601 lbs. of milk in 11 months and 10 days, and was still giving 30 lbs. per day

Our next consideration should be with the milk vessels. The udder in the first place, when full, must be large and evenly balanced. While it is possible to have cows with large udders that are indifferent milkers, yet a heavy milker seldom has a small udder. The udder should be as deep and wide and long as it is possible to get it, extending well forward, and well up behind, free from fleshiness, and when milked out, the skin should be loose and pliable, of fine texture, and, as the dairyman would say: "plenty of leather behind." Along with this, of course, there must be four good-sized teats, evenly placed. Passing from the udder, it is wise to examine the milk veins to see that they are large, as numerous, as tortuous, and as long as it is possible to get them, and ending in two or more milk wells.

Many animals will give a very heavy flow of milk for a short period, drying up rather abruptly at five or six months after freshening. Other animals keep up a heavy flow throughout a long milking period, even under unfavourable conditions of housing and feeding. In order to build up a profitable herd, it is necessary to look for the type of animal that will prove herself to be a persistent milker. Our experience goes to show that the majority of the persistent milkers possess milk veins which extend well forward, and in the case of a couple of cows, which are outstanding in this respect, the milk veins extend forward to, and enter the milk well just behind the fore-leg.

A point sometimes overlooked, and one which is very important in the dairy cow, is openness of conformation, in other words, an entire absence of compactness of form. In the heaviest milkers the spaces between the vertebræ are open, and the ribs correspondingly far apart. The tightly built, compact cow will be found to lay on flesh instead of giving returns at the pail.

Lastly, let us look for cows with a breedy appearance, indicating that they have sprung from ancestors that have been carefully selected. A clean cut head, showing strength, yet sweetness, the lines of the body symmetrical and true, and in cases of broken colour or spotted cows, the lines of demarkation between the colours distinct and clearly defined, are all indications of good breeding.

In purchasing a herd of cows it will be necessary to sacrifice some, or perhaps a number, of the above mentioned points. There are three points, however, which will count for much if found uniformly throughout the herd, namely: constitution, capacity and quality.



Feeding of Dairy Cattle

THE question of supplying the right kind of feed for the dairy cow at a minimum cost has occupied the minds of all good dairymen since dairying first became an industry. When it is considered that there are in Canada 2,594,179 dairy cows, and the value of dairy products in 1913 amounted to \$120,000,000.00, and that the average number of pounds of milk for each cow in 1900 was 2,850 pounds, and in 1910, 3,805, a gain of nearly 1,000 pounds, amounting to nearly \$25,000,000.00, largely due to better feeding, some idea can then be formed of how important is the question of feeding the dairy cow.



Ayrshire Calves, Claresholm Demonstration Farm

There are two factors which largely control the economical production of milk. One is the adaptability of the cow used for the purpose, and the other the amount and kind of feed supplied.

The problem confronting the dairymen is to produce the largest amount of milk and butter at the least expense. Everyone knows the value of pasture grass for any kind of live stock, especially for the dairy cow, and the dairymen welcome the warm spring days when their cows can enjoy

this feed. They not only produce more milk, but also gain in flesh as well, and this goes to show that good pasture grass is almost a perfect food, a balanced feed or ration, and suggests what the dairymen ought to do—that is, to imitate summer conditions as far as possible throughout the year. These consist of :

1. An abundance of palatable food.
2. Succulent food.
3. A balanced ration.
4. Moderate temperature.
5. Comfortable surroundings.



Yearling Heifers, Stony Plain Demonstration Farm

In this western country one of the problems is to secure a supply of pasture grass. When prairie sod is broken up and a couple of crops of grain taken off, it is difficult to get a good catch of grass for pasture purposes in some parts of the Province. On the Demonstration Farms we are endeavouring to grow crops to take the place of, and to supplement the native pasture. The plan adopted at the present time is to sow fall rye in the month of June. This serves for pasture from about August until it freezes up. In the spring this rye starts growing early, and is used for pasture again, until the time it begins to head, when it can be cut for green feed, or left to ripen. As soon as the ground is fit to cultivate in the spring, some fall wheat is sown on another piece of ground, and later some oats, or a mixture of oats and fall wheat. If a sufficient number of acres is sown of these three grains at different times as indicated, a good supply of pasture can be had

throughout the entire summer, and by having a couple of extra rolls of wire and a few fence posts the land sown for pasture can be fenced each year.

To secure the largest returns a cow should milk ten months in the year. She requires at least two months' rest at the end of each lactation period, to fit her for the next year's work. It is also very necessary to have this rest for the sake of the influence it will have on the young calf. A cow that is milked to within a few weeks of calving generally has a calf lacking in vitality, and if this practice is carried on from year to year its effect will soon be seen in a lessened vitality throughout the whole herd.



Jersey Herd, Medicine Hat Demonstration Farm

During these two months' rest the cow should be fed as liberally as when milking, and this means that cows should be well fed the entire year, introducing as far as possible summer conditions during the winter months.

According to chemical analysis all foods contain a certain amount of digestible dry matter, and this dry matter is composed of constituents called protein, carbohydrates and fat. Of the three, protein is the most expensive and most important, and there is generally enough of the other two in most feeds. Protein is the tissue building, muscle forming food. It constitutes to a large extent the white of eggs, the lean in meat, and the casein in milk, and is generally between 3% and 4% of milk, so that it is important that the dairy cow be supplied with sufficient protein in her feed. To get the best results from a dairy cow she must be fed a certain proportion of these three feeds, and this is what is called a balanced ration. A balanced

ration is the feed or combination of feeds furnishing the several nutrients in such proportion and amount as will properly, and without excess of any nutrient, nourish a given animal for 24 hours.

The ratio which exists in any given feeding stuff between the digestible crude protein and the digestible carbohydrates and fat is called the nutritive ratio.

Pasture grass has a nutritive ratio of one to five or thereabouts, that is to say, one part protein to five parts carbohydrates. Concentrates high in protein are very expensive, so that if a large amount of protein can be furnished in the rough feeds grown on the farm, it is going a long way to produce cheap milk during the winter months. This feed can be found among clovers, especially alfalfa. By feeding this with corn silage and roots which are succulent and palatable, and concentrates such as ground oats, bran and oil cake, and by keeping the cows in a good, warm, well lighted, well ventilated stable, summer conditions are being imitated as closely as possible.

But a great many will ask, "Can corn and alfalfa be grown in this Province?" On the Sedgewick Demonstration Farm, situated about 100 miles east of Wetaskiwin, about nine acres of corn were grown the past year, from which a silo, 15 feet in diameter and 24 feet high, was filled. The ensilage in this silo is of excellent quality, and is greedily eaten by the stock. Good crops of corn were also grown on the Vermilion and Medicine Hat Demonstration Farms.

Alfalfa is only in the experimental stage in the greater part of this Province, as yet, but it will no doubt be grown extensively in the future. In the meantime, until this crop is grown successfully, green feed, prairie hay and tame hay can be used for rough feeds; and ground oats, oil cake and bran for concentrates,—the oats and bran to be mixed in equal parts by weight, and from two to three pounds of oil cake for each cow per day. In determining the amount of concentrates to feed, the condition of the cow, the kind of rough feed being fed, and the quantity of milk the cow is giving must be taken into consideration. If the cows are thin in flesh a few pounds of barley may be added to the ration. But it is not advisable to feed barley for a couple of weeks before, and about the same length of time after freshening. In addition to this, roots should be fed to supply succulence, and they also tend to keep the cows in good healthy condition.

The dairy cows at the Demonstration Farm at Vermilion were fed this feed last year, and twenty-eight cows gave an average of 8,898 pounds each, which will compare very favourably with any of the good herds in Ontario.

No hard and fast rule can be laid down how to feed dairy cows, or any other class of live stock, and all feeding rations and standards are only to be used as guides. The dairyman, after first getting all the information he possibly can, is called upon at all times to use his own judgment. But it is important that dairymen feed liberally; there is more in feed than breed, though breed is important, and a large percentage of our dairy cattle at the present time are underfed.

Feeding Cows for a Seven Days' Record

THIS is the sporting side of the dairy business. The value of the test is not in the extra amount of milk given, but in the added value attached to the cow, by virtue of her being able to make a record, the same as the value is added to the race horse by the winning of a race. Just as the racing game has interested man in the breeding and improvement of horses, so have these dairy tests enthused men in the development of greater milk production in dairy cows. For many years long prices have been paid for winning horses in the sporting world, similarly do we find people willing to pay fancy prices for a dairy cow with the ability to make an extraordinary record.

In fitting a cow for one of these record tests, care should be taken to have her in the best possible condition at the time of freshening, as her ability to make a record is largely determined before that time. For at least two weeks previous she should be fed on cooling, laxative food, such as roots, bran, oilcake, and alfalfa hay, green feed and ensilage. These



*"Vrouka Queen" 7 day record,
110 days after freshening, Milk 523 lbs., Butter 23.79 lbs., Olds Demonstration Farm*

cooling feeds are preventatives against milk fever and garget. When she has regained her normal condition after freshening, start to increase her feed gradually, until on a full ration, which should show a nutritive ratio of about one to four, care being taken not to over feed her at the outset, which of course would be fatal to the test.

In order to make a large record a cow must consume a lot of food, and to do this she must have a good appetite. Her appetite will depend to a great extent upon the palatability, succulence and variety of her feed. Constant care must be exercised to see that she consumes all she can possibly digest and assimilate, without over feeding.

In conclusion, let us consider a few safe rules:

Always place the food before the cow in an appetizing manner, and see that her manger is kept sweet and clean.

Weigh every ounce of grain and roots fed, that you may know exactly what you are doing.

Start milking and feeding regularly to the minute. Always keep the cow looking for her feed.

Brush the cow after each milking, and between milkings do not molest her; keep her as quiet as possible.

For exact feeds and quantities to be fed no hard and fast rules can be laid down, as it is impossible to find two cows just alike, and this is where the work of the experienced dairyman will count in studying the individuality of his animal.



*Herd Bull "Blackness De Kol Korndyke," sired by "Pontiac Korndyke,"
Vermilion Demonstration Farm*

Results of Dairy Tests

WE have made a practice since the establishment of the Demonstration Farms of weighing the milk daily. Many of our cows have not had a very good chance yet to prove their value as producers of milk. We have found, as has been the experience of other farmers, when cows are shipped from Ontario, if they are flush in milk at the time, that they usually do not give very good results for that year, and that we frequently have considerable difficulty in getting them with calf. So that really a herd of cows brought into the province, unless you have exceptionally good fortune, requires to be here over a year before a test can be made that will be fair to these cows. On several of the Farms, however, we have during the past year made rather exceptional records. At Olds and Vermilion we have had some 25 cows milking, and on the Olds farm eleven of these cows have given us an average of 12,578.6 lbs. of milk in an average of 10.9 months each, and eleven cows at Vermilion in practically the same time, that is an average of 11 months, have given us an average of 11,158 lbs. each. Nine of these cows are pure bred and thirteen of them grades, and we doubt if there are many stables of cows in Canada that will show a better average.

At Sedgewick, our dairy Shorthorns have produced rather phenomenal results. "Lady McKay 2nd" heads the list with 10,472 lbs. in twelve months, and we have two or three other cows that may possibly beat that record at the end of the twelve months. Fourteen Shorthorn cows on the Sedgewick farm, five of which are two-year old heifers and one a three-year old heifer, leaving eight mature cows, have given an average of 6,049 lbs. of milk in an average of 7.92 months each. As the record of performance for a Shorthorn cow has been placed at 5,500 lbs. for twelve months, the fact that we have fourteen cows, almost half of which are only heifers, which have exceeded the requirement of the record of performance by 500 lbs. in less than an average of eight months each, is a record that we do not believe any Shorthorn herd in Canada can equal, and there is not more than one herd in the United States that can come near this record.

The following tables give the results of these individual cows on the farms mentioned :

OLDS FARM

Vrouka Queen.....	15,077 lbs. in 10 months
Daisy of Ferndale.....	12,785 lbs. in 12 months
Minnie May of Ormond.....	12,368 lbs. in 10 months, 10 days
Mabel Belle.....	11,350 lbs. in 11 months, 11 days

Grade No. 23.....	16,601 lbs. in 11 months, 10 days
Grade No. 16.....	14,449 lbs. in 12 months
Grade No. 20.....	13,040 lbs. in 12 months
Grade No. 21.....	12,921 lbs. in 12 months
Grade No. 25.....	10,707 lbs. in 12 months
Grade No. 1.....	9,808 lbs. in 9 months, 12 days
Grade No. 5.....	9,261 lbs. in 9 months, 8 days

Total, 138,367 lbs.

Average, 11 cows, 12,578.6

Average No. of months, 10.9

VERMILION FARM

Camille A. Abbekirk.....	13,300 lbs. in 12 months
Blossom Hengerveld Teake.....	13,288 lbs. in 11 months, 15 days
Barbara Tensen 3rd.....	13,381 lbs. in 12 months
Maxy's Beauty.....	11,916 lbs. in 12 months
Georgie.....	10,177 lbs. in 11 months, 15 days

Grade No. 1.....	12,433 lbs. in 10 months
Grade No. 2.....	10 439 lbs. in 12 months
Grade No. 3.....	9,711 lbs. in 8 months
Grade No. 4.....	9,476 lbs. in 12 months
Grade No. 5.....	9,369 lbs. in 9 months
Grade No. 6.....	9,245 lbs. in 12 months

Total 122,735 lbs.

Average, 11 cows, 11,158 lbs.

Average No. of months, 11

SEDGEWICK FARM

Mature Cows

Lady McKay 2nd.....	10,472 lbs. in 12 months
Kilblean Beauty.....	9,699 lbs. in 11 months
Ruby.....	9,006 lbs. in 12 months
Lady McKay 3rd.....	6,660 lbs. in 7 months, 19 days
Daisy 5th.....	6,479 lbs. in 6 months
Minnie 2nd.....	5,158 lbs. in 6 months
Roan Blossom.....	4,801 lbs. in 4 months
Rose of Kentucky 36th.....	4,663 lbs. in 5 months

Three-Year Old Heifer

Butterfly's Lady McDonal.....	5,489 lbs. in 12 months
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Two-Year Old Heifers

Dairy Blossom.....	5,102 lbs. in 9 months
Lady McDonal 3rd.....	4,645 lbs. in 7 months
Kilblean Rose.....	4,252 lbs. in 7 months, 15 days
Braemar Belle.....	4,173 lbs. in 8 months
Butterfly Lady McKay.....	4,090 lbs. in 5 months

Total, 84,689 lbs.

Average, 14 cows, 6,049 lbs.

Average No. of months, 7.92

Care of Milk on the Farm

THERE is no article of diet so universally used among people of civilized nations as milk, either in the form in which it is drawn from the cow, or in manufactured products. There is no food which is so essential to the development and growth of our children as milk, and none which by careless handling will absorb so many odours, and develop so many bacteria, injurious to the health of children.

It is important that milk be given most careful attention from the time it is drawn until it is consumed. The first half hour after milking is the most important time to exercise care. All milk contains more or less injurious bacteria, and the number of these can be greatly reduced if it is remembered that they gain access to the milk through dust or dirt. This filth may drop off the cow as she is being milked, or the milk may become contaminated by being exposed in a filthy stable, hence the necessity of keeping stables scrupulously clean, the cows well brushed before milking, and also the milkers themselves clean and tidy. It is of advantage to white-wash the stables three or four times a year, to keep them sweet and bright.

After using every precaution to keep dirt and bacteria out of milk a certain amount still gets in, and if the milk is left at the temperature at which it is drawn, these bacteria increase very rapidly, therefore it is necessary to take some steps to stop their development. This can be done by cooling to a temperature below fifty degrees, practically checking all growth for at least 24 hours, and after this they multiply very slowly so long as the milk is held at this temperature.

The taking care of milk on a farm can be summed up in a few words. Keep everything pertaining to the dairy, stables, cows and attendants as clean as possible. Keep all utensils perfectly clean and sterilize them either with boiling water or steam after each milking. Do not leave milk in the stables behind the cows after it is drawn. Remove each cow's milk at once to the cooling room as soon as milked, and cool by running over a cooler, or by setting in a tank of ice water.

In the case of cream furnished to creameries the same care should also be taken. It is true that cream is allowed to sour before churning, but the bacteria which sours cream can be developed better by the use of cultures after it is in charge of the creamery men. Thus it is possible for them to promote uniform ripening of all the cream and check all bacteria which impart a bad flavour to the butter.



After milking with the machine. Stary Plain Demonstration Farm

Building up a Dairy Shorthorn Herd

The one great difficulty which has prevented dairy Shorthorn development in the past has been the scarcity of dairy Shorthorn sires. A number of men have secured good foundation females, but on account of their inability to secure the proper kind of herd header, it has been impossible for them to develop a high class herd. In some instances breeders have purchased sires on the recommendation of the owner of the animal, only to find out later that the progeny are not proving out good milkers.

In the strictly dairy breeds of cattle it is possible to be guided in the purchase of a sire by the type which the animal should measure up to; but in dairy Shorthorns it is not so easy to determine from the type of a bull what his ability will be in transmitting milking qualities to his offspring. This is accounted for by the fact that the beef characteristics and dairy characteristics must be combined in one and the same individual, and the only safe method to be guided by is to choose a sire from a heavy producing, high testing dam of good type.

Having found a bull of this breeding one may then be concerned with the conformation of the animal. First and foremost he must have constitution as indicated by the fullness of heart girth, showing a deep chest, no depression behind the shoulders, and in his general appearance have a vigorous, strong, rugged look. His scale, substance, depth of barrel and deep fleshing qualities should be quite equal to any first-class beef bred bull.

Among the distinguishing features which would specially mark him as a good dual purpose sire, quality is undoubtedly the first characteristic worthy of mention. This quality can be determined by the fineness and pliability of the skin, the texture of the hair, the absolute lack of coarseness throughout, and at the same time having true, sweet, symmetrical lines. Other points to look for would be a fairly sharp shoulder, not as pronounced as in the strictly dairy bred sire, but with the same openness of conformation in the vertebrae, carrying this openness throughout in quite the same degree which would be desired in a sire of one of the dairy breeds. In short, the dual purpose sire should show no tendency to compactness of form or tightness of make up, such as would be looked for in a beef bred bull, and above all other things his quality must be an outstanding feature.

The dairy Shorthorn bull, Butterfly King, now at the head of the Sedgewick herd, has more Record of Merit daughters to his credit than any other dairy Shorthorn bull in Canada, and he possesses this characteristic of quality throughout, in a very marked degree. Even though he is now ten years old, his skin and hair possess a quality rarely seen in younger animals of the special dairy breeds. This, combined with a smoothness of conformation



Dairy Shorthorns from Sedgewick and Claresholm



Dairy Shorthorns from Sedgewick and Claresholm

and an openness of form, is a characteristic which marks him as one of the very choicest dairy Shorthorn sires. In his prime he would have stood in good company in any beef show ring. He possesses a deep fleshing throughout, with plenty of scale and substance. However, the best guarantee of this bull's value as a dairy Shorthorn sire is that he has produced so many daughters with his same scale, substance and deep fleshing qualities, and at the same time so many heavy persistent milkers. Chief among his daughters at the Sedgewick Demonstration Farm worthy of mention are "*Kilblean Beauty*", "*Lady McKay 3rd*", "*Butterfly's Lady McDonal*", and "*Butterfly's Lady McKay*." Their records are as follows:—

"*Kilblean Beauty*", calved 1st June, 1913, 8343 pounds of milk to March 1st, 1914.

"*Lady McKay 3rd*", freshened 10th September, 5284 pounds to 1st of March, 1914.

"*Butterfly's Lady McKay*", calved December 3rd, 1913, 2561 pounds to March 1st. Three years old.

"*Butterfly's Lady McDonal*", calved April 15th, 5208 pounds to March 1st. Four years old.

"*Lady McDonal 3rd*", freshened 1st of October, 3454 pounds to March 1st. Two years old.

After one has secured cows of this character from such a splendid sire, the all important matter is to find a sire with which to breed these females. Too often men have taken the animal which was handy rather than spend time in looking up the best sire to be found. Again, there are certain good sires which will not cross well on certain females. This, of course, can be determined only by experiment.

We were very fortunate in securing another bull by the name of "*Braemar Champion*", which stood at the head of Mr. James Brown's noted herd of dairy Shorthorns for some years. We find that this bull is crossing excellently on Butterfly King cows, his daughters being among the best producers in the Sedgewick herd. This is probably accounted for by the fact that "*Braemar Champion*" traces back directly to Butterfly foundation stock.

Since establishing this herd a large number of dairy Shorthorn bull calves and yearlings have been sold to farmers throughout the Province. The demand for these has been much greater than our supply. There has also been a very great demand for heifers as well, but most of the heifers are retained, in order to build up a larger breeding herd.

The Claresholm herd is somewhat smaller than the one at Sedgewick, but also has some heavy producing cows. Chief among the cows of this herd might be mentioned, "*Glenwood Alice*", the cow that stood fourth at the International Live Stock Show in Chicago in 1912; "*Lula Rey*", a cow running somewhat to the dairy type, and perhaps the heaviest milker in either herd; "*Pride of Mosa*", rather an old cow, but a splendid type of dairy Shorthorn. Heading this herd we have a young bull sired by "*Braemar Champion*", and



*"Butterfly King," the Greatest Sire of Dairy Shorthorns in Canada,
Sedgewick Demonstration Farm*

out of "Lady McKay 3rd", a cow now owned by the Sedgewick Demonstration Farm. This cow won the Grand Championship in the Guelph Fat Stock Show in the dairy competition, 1910, giving 60 pounds of milk per day. During the present season she gave as high as 1507 pounds in one month. Unfortunately she met with an accident in the middle of the season and consequently her record for the present year is only 9993.3 pounds in 10 months and 21 days.

There is no question that the dairy Shorthorn is a serviceable animal for many farmers in this Province. Not being equipped with good dairy barns and being quite a distance from market, the matter of handling one of the special dairy breeds is out of the question, for some. The special dairy animal no doubt yields large returns when well cared for in a comfortable building, and particularly so when one is located close to a market so that milk or cream can be delivered every day. When one is so situated, however, that the special purpose dairy cow is not practicable, the dairy Shorthorn animal takes a place which cannot be filled by any other breed. A fair amount of milk can be secured and at the same time the calves can be kept, and will grow into profitable steers at from two to three years old. While the dairy Shorthorn will produce best returns under the same care that should be given the strictly dairy animal, yet she will produce good returns even with very ordinary treatment.

With the present tendency among dairymen to create high milk records there is just a danger that those engaged in the dairy Shorthorn busi-

ness will strive after the same thing. It must be remembered, however, that when the animal is highly developed in one direction it is usually at the expense of some other quality. The milking qualities of many of our dairy animals have been developed to a very high degree with the result that these animals have lost to a great extent the ability to put on flesh. It is to be hoped that care will be exercised in the breeding of dairy Shorthorns, and that men will not encourage the desire for heavy milk production in this breed. If an attempt is made to develop very heavy milking qualities it will doubtless be at the expense of their already highly developed beef characteristics, and if milk production is going to be the most important consideration in developing the dairy Shorthorn, would it not be better for those anxious in this respect to choose one of the special dairy breeds which already have these dairy characteristics highly developed? Our object should be in breeding dairy Shorthorns to preserve the scale, the substance, the wealth of flesh, and the rugged constitution which make the Shorthorn a famous breed, and at the same time develop in a reasonable degree their milk producing qualities.

For those who are contemplating the building of a dairy Shorthorn herd we would emphasize first the securing of as good foundation stock as it is possible to secure with the available money, then to take a great deal of care in the choice of a sire, and in the choice of succeeding sires; to sell none of the heifers until they are tried out as milkers, to weigh the milk from all animals and dispose of heifers and cows which do not come up to a certain standard, keeping those which pass that standard, provided they are the



Young Shorthorns from Sedgewick Demonstration Farm

approved type of animal. In building up a dairy Shorthorn herd the matter of the tuberculine test is quite as important as in building up any other breed. A certain percentage of our animals are sure to be affected with tubercular trouble, and it has been demonstrated beyond question that one animal will convey the disease to another if kept in close proximity. For this reason it will be seen how important it is to test the herd in order that the diseased animals may be separated from the healthy ones, and while we would not recommend the destruction of the animal re-acting with tuberculine test, yet we would urge that the test be made, and that the stable be cleared of all animals re-acting; these animals to be placed in other quarters to be tested again or disposed of.

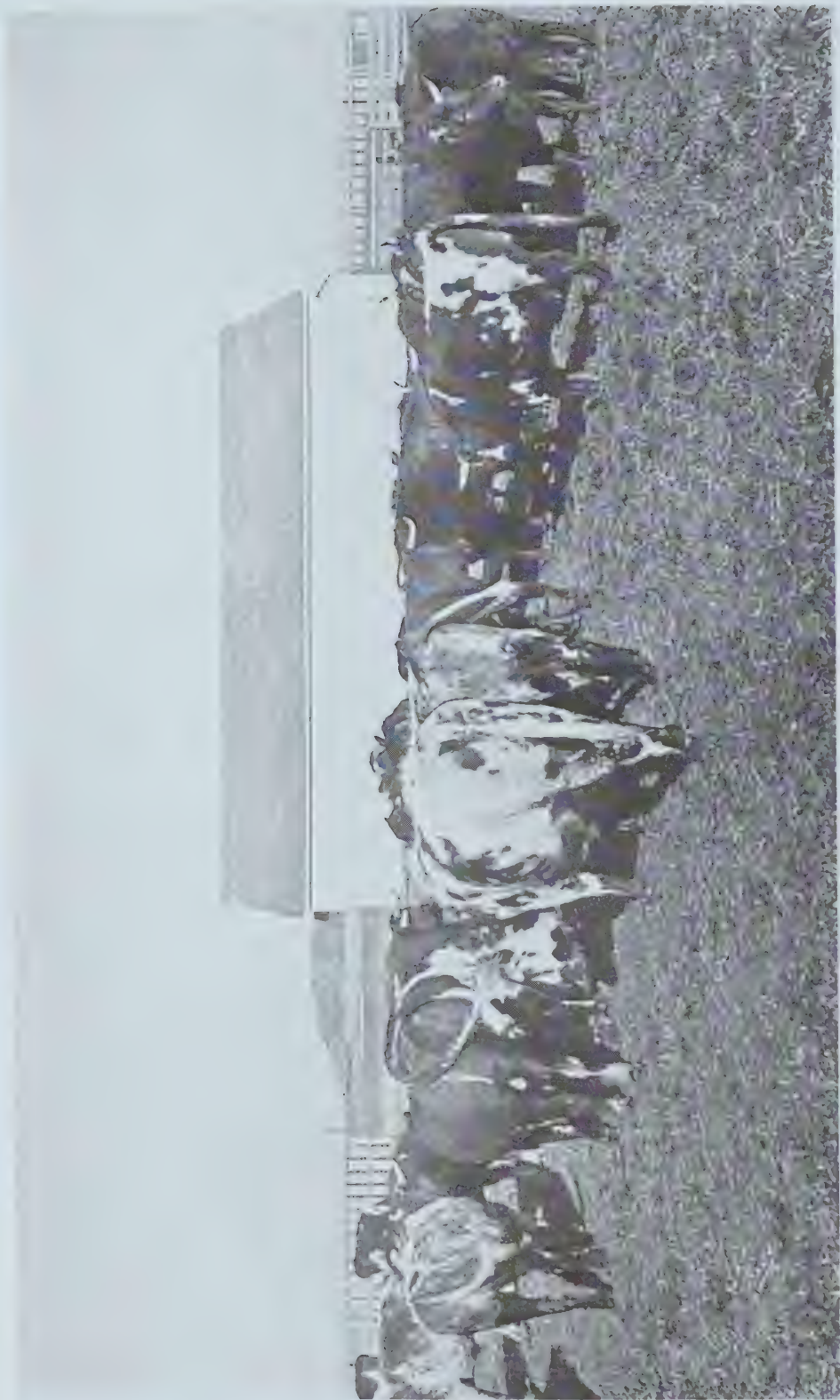
DAIRY SHORTHORN RECORDS, SEDGEWICK FARM

"Lady McKay 2nd".....	10 months 21 days.....	9993.3
"Sweet Cherry".....	11 months 9 days.....	8663.4
"Kilblean Beauty".....	9 months.....	7593.3
"Lady Dryden 3rd".....	7 months 23 days.....	5392.5
"Lady McKay 3rd".....	5 months 19 days.....	5284.
"Daisy 5th".....	3 months 24 days.....	4753.8
"Rose of Kentucky".....	3 months 3 days.....	3574.4
"Minnie 2nd".....	3 months 24 days.....	3768.1
"Roan Blossom".....	2 months.....	2597.7
"Butterfly's Lady McDonal".....	10 months 18 days.....	5208.5
"Dairy Blossom".....	6 months 19 days.....	4268.3
"Braemar Belle".....	6 months.....	2382.7
"Kilblean Rose".....	5 months 15 days.....	3312.2
"Lady McDonal 3rd".....	5 months.....	2854.9





Dairy Shorthorns, Sedgewick Demonstration Farm
"Lady McKay 2nd" "Lady McKay 3rd" "Kentucky Rose" "Butterfly King"



Steers in Feed Lot, Stony Plain Demonstration Farm.

Steer Feeding

DURING the season of 1913 three hundred and ninety steers were fed on four of the Demonstration Farms. Results of previous years have convinced us that outdoor feeding is profitable, provided it is possible to secure large, smooth steers, with good breeding and with plenty of substance. As each year passes the problem of buying suitable steers for outdoor feeding becomes greater. We have found in our work that unless two-year-old steers are well grown and in good condition, it does not pay to feed them, and particularly is this the case if they have to be put into a yard with older cattle. In buying large steers there is also the advantage of the spread in prices between fall and spring. If a 1,000 pound animal is bought in at 6c. and sold at 8c. the profit on account of the spread in prices amounts to \$20.00, and if a 1,200 pound animal is bought in at 6c. and sold out at 8c. the profit on account of the spread in prices is \$24.00,—a direct gain of \$4.00 in favour of the heavier steer. In addition to this we find that the large steers will put on a much greater weight than the small steers in a given length of time, with practically the same amount of feed.

In buying bunches, one is frequently forced to take some thin steers in order to get those of the bunch which are desirable. Experience goes to show that the steers which go into the feed lot thin, generally come out in the same condition. Our idea is that there is some constitutional trouble responsible for the thin condition of the animal, and if this cannot be cured on the grass there is very little chance of improvement when put into winter quarters. The method lately has been to cut out the thin cattle about Christmas, and sell them at the market price.

There always will be a few cattle that do not feed well, sometimes because they are shy, or possibly because they are wild. It is a good practice to cut out these cattle and sell them as soon as it can be determined that they are poor doers.

There seems to be very little difference in favour of any of the crosses of the various breeds of cattle for feeding purposes. Shorthorn blood predominates in the greater portion of the bunches; however, we have had good feeders of Hereford, Galloway, Angus and Highland breeding. There is no doubt that conformation, quality and size of the animal count for a great deal more than the breeding, provided the animal has a preponderance of blood of one of the four or five recognized beef breeds.

Our experiments in the last three years lead us to believe that the proper time to buy feeder steers is in the month of August. This is sufficiently late in the summer to get the benefit of the decline in prices from late spring beef, and yet it is early enough to escape the rising prices for fall beef. Combined with this there is the advantage of being able to put on about 100

pounds of weight, by keeping them on the stubble fields or on some good pasture land before it is time to put them into the feed lot. Best results have been secured by purchasing 1,200 pound cattle in August, turning them into the feed lot about the first of November, or as soon as the weather gets cold, and as quickly as possible bringing them to a grain ration of ten or twelve pounds, commencing about four pounds per head, and increasing at the rate of two pounds per week. If hay is cheap and easily secured it is an advantage to have plenty in the feed racks at all times. Sufficient cut sheaves should be fed in troughs or tables, so that the animals will not be hungry at any time of the day. When the animals bunch in one corner of the yard at feeding time, looking for feed, it is a pretty good indication that they are not getting enough.

Our work has convinced us that it is necessary to confine steers within a fenced yard if best results are to be obtained; that it is economical to cut the feed, and to feed the chop mixed with the cut sheaves. In feeding chop the best satisfaction has been secured with equal parts of ground oats and barley. Some low grade wheat has been used in the mixture, but it has not given as good satisfaction as equal parts of oats and barley. At all times the animals have access to plenty of water and salt. When feeding a large bunch it is a difficult matter to keep sufficient straw in the yard for bedding, but it is a very important matter, especially in cold weather, to see that the animals have a comfortable place to lie down, not alone that they have plenty of straw, but that the yard is kept free from frozen lumps.

During the winter of 1913-1914 two bunches of steers at the Vermilion and Claresholm Farms are being fed on cut straw with a ration of grain. At the time of writing both of these bunches are doing particularly well. They are not putting on quite as much weight as the cattle fed on cut green sheaves and hay, but on account of the difference in the cost of the feed it is evident that it is quite a profitable system to feed in this way. The Vermilion bunch was changed to green sheaves about the middle of January. The Claresholm bunch, however, will be fed throughout the whole season on cut straw and chop, without any green sheaves or hay.

Although the prices paid for feeders in the fall of 1912 were considerably higher than have been paid for some time at that season of the year, yet prices in the following spring were correspondingly high, with the result that the feeding of cattle proved to be very profitable. The following is a statement of the results:—

Statement of Steer Feeding at Vermilion Demonstration Farm

Weight of 100 steers weighed out, April 27th, 1913.....	136,925 pounds
Weight of 2 steers kept over.....	2,825 pounds
Weight of 2 steers died.....	2,700 pounds
Total.....	142,450 pounds
Weight of 104 steers weighed in.....	129,460 pounds
Gain in weight.....	12,990 pounds

Average weight of 104 steers weighed out.....	1,370 pounds
Average weight of 104 steers weighed in.....	1,244 pounds

Increase in weight.....	126 pounds
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These cattle were weighed off cars in Edmonton, the shrink in shipping amounting to 124 pounds per head, making a total gain of 250 pounds per head.

By sale of 100 steers, April 23rd, 1913, at 7½c.....	\$10,269.38
By sale of 2 steers, kept over.....	204.81
By gain in weight of hogs running after steers, 4,400 pounds, at 8c.....	352.00

Total amount realized.....	\$10,826.19
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To price of 104 steers weighing 129,460 pounds, at 5¼c.....	\$6,796.65
To interest on note.....	307.31

To Feed of steers:—

Pasture.....	30.00
143 tons of green feed at \$5.00 per ton.....	715.00
1,074 bushels of oats at 25c. per bushel.....	268.50
716 bushels of barley at 35c. per bushel.....	250.60
344½ bushels of wheat at 40c. per bushel.....	137.80
Gasoline.....	84.10
Salt.....	3.00
Coal.....	5.20
Labour.....	407.45

Total cost of steers.....	9,005.61
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Total net gain.....	\$1,820.58
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 Net gain per head \$17.50.

Average selling price per steer including price of hogs.....	\$104.09
Average purchase price per steer.....	65.35

Gross profit per head.....	\$38.74
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Statement of Steer Feeding at Sedgewick Demonstration Farm

Weight of 106 steers weighed out on April 27th, 1913.....	140,405 pounds
Weight of 106 steers weighed in October 23rd, 1912.....	119,396 pounds

Gain in weight.....	21,109 pounds
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Average weight of 106 steers weighed out.....	1,325 pounds
Average weight of 106 steers weighed in.....	1,125 pounds

Average increase in weight.....	200 pounds
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By sale of 94 steers weighing 128,230 pounds, at 7½c., 5% shrink.....	\$9,136.42
By sale of 10 steers weighing 10,850 pounds, at 7c., 5% shrink.....	721.49
By sale of two steers, kept over, 2,750 pounds, at 7½c., with 5% shrink.....	195.97

Total amount realized.....	\$10,053.88
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To price of 100 steers weighing 112,640 pounds, at \$5.75 per 100 lbs.....	\$6,476.80
Commission for buying.....	100.00
Price of 6 steers weighing 6,756 pounds...	366.00

Total weight..119,396 pounds....	\$6,942.80
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To freight of steers from Camrose to Sedgewick..	80.00
Interest on note	169.24

To Feed of steers:—

188 tons and 1,000 pounds of green feed, at \$5.00 per ton.....	\$942.50
50 tons of hay, at \$4.00 per ton.....	200.00

GRAIN

320 bus. of wheat, at 25c. per bus.....	80.00
210 bus. of wheat and oats, at 25c. per bus....	52.50
1,469 bus. of oats, at 23c. per bus.....	337.87
706 bus. of barley, at 32c. per bus.....	225.90
Labour.....	475.50
Gasoline.....	46.90
Salt.....	12.60

Total cost.....	9,565.81
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Total net gain.....	\$488.07
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Net gain per head \$4.60.

Average selling price per steer.....	\$94.85
Average purchase price per steer.....	65.49

Gross profit per head.....	\$29.36
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Statement of Steer Feeding at Olds Demonstration Farm

Weight of 105 steers weighed out May 2nd, 1913.....	157,250 pounds
Weight of 105 steers weighed in November 8th, 1912.....	140,165 pounds
Gain in weight.....	17,085 pounds
Average weight of 105 steers weighed out.....	1,498 pounds
Average weight of 105 steers weighed in.....	1,335 pounds
Average gain in weight.....	163 pounds
By sale of 103 steers, May 2nd, weighing 153,850 pounds, at $7\frac{1}{2}$ c.....	\$11,538.75
By sale of 2 steers, kept over, 3,400 pounds, at $7\frac{1}{2}$ c.....	255.00
Total.....	\$11,793.75
By gain in weight of hogs running after steers....	63.00
Total amount realized.....	\$11,856.75
To price of 105 steers weighing 140,165 pounds, at \$5.70 per 100 lbs.....	\$7,989.40
Freight from Grassy Lake to Olds.....	144.28
Interest on note.....	296.25
Brand certificate.....	4.50
To Feed of steers:—	
Salt, \$2.90; coal, for tank heaters, \$7.00....	9.90
60 tons of green feed, at \$5.00 per ton.....	300.00
126 tons, 1,150 pounds of hay, at \$4.35 per ton.....	550.65
GRAIN	
3,000 bus. of oats, at 25c. per bus.....	750.00
800 bus. of barley, at 35c. per bus.....	280.00
Gasoline.....	66.00
Labour.....	499.65
Total cost of steers.....	10,890.63
Total net gain.....	\$966.12
Net gain per head \$9.20.	
Average selling price per steer, including profit on hogs.....	\$112.92
Average purchase price per steer.....	76.09
Gross profit per head.....	\$36.83

Statement of Steer Feeding at Claresholm Demonstration Farm

Weight of 81 steers weighed out on May 27th, 1913.....	121,990 pounds
Estimated weight of steer sold in January, 1913.....	1,400 pounds

Total.....	123,390 pounds
Weight of 82 steers weighed in, Nov. 8th, 1912.....	108,680 pounds

Gain in weight.....	14,710 pounds
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Average weight of 82 steers weighed out.....	1,504 pounds
Average weight of 82 steers weighed in.....	1,325 pounds

Increase in weight.....	179 pounds
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By sale of 81 head of steers, April 21st, 1913, at 7½c.	\$9,149.25
By sale of 1 steer, January 10th, 1913.....	65.72

	\$9,214.97
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By gain in weight of hogs running after cattle....	30.00
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Total amount realized.....	\$9,244.97
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To price of 82 steers, weighing 108,680 pounds, at	
\$5.70 per 100 lbs.....	\$6,194.76
Freight from Grassy Lake to Claresholm....	82.64
Brand certificates.....	4.10
Interest on note.....	191.85

To Feed of steers:—

186 tons and 250 pounds of green feed, at	
\$4.00 per ton.....	\$744.55
349 bus. and 15 pounds of wheat, at 40c. per	
bus.....	139.70
2,182 bus. of oats, at 24c. per bus.....	523.68
124 bus. of barley, at 34c. per bus.....	42.16
Salt.....	2.30
Gasoline.....	74.10
Coal.....	4.87
Water.....	40.00
Labour.....	287.45

Total cost of steers.....	8,332.16
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Total net gain.....	\$912.81
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Net gain per head \$11.13.

Average selling price per steer, including profit on 30 hogs.....	\$112.74
Average purchase price per steer.....	75.54
Gross profit per head.....	\$37.20
Price of feed purchased and fed to steers.....	\$ 406.37
Price of feed grown on farm and fed to steers.....	1,043.72
	\$1,450.09

The farm also supported 35 head of breeding cattle.

Sheep

SETTLERS have been flocking into the Canadian West during the past few years in very large numbers. These men have perhaps sold out small bands of sheep before coming, and on looking into the conditions here are very desirous of again starting a flock. Thus in Western Canada at the present time, and it will be true for years to come, there is a splendid opportunity for men in the sheep business to supply those who wish to start a flock. Looking at the development of agriculture on these prairies, one can think of no line of endeavour that promises much better results than does the sheep industry.

Value of Sheep on the Farm

In certain sections of the Province where there is an absence of timber and where the soil is more or less light, the winds often cause serious trouble by blowing or drifting the soil. In such districts sheep almost invariably prove to be very beneficial in tramping or compacting the land. Indeed it is very difficult to handle this soil as a summer fallow, and many practise the method of seeding a light grain crop early in the spring before the land is dry enough to blow. In well prepared soil the weed seeds will spring up along with the grain sown. The growth will prevent the blowing of the soil, and will form a very excellent pasture for the sheep. While the sheep are eating the grain and weeds they are tramping or compacting the soil. This is one of the most profitable methods of handling the summer fallow.

At the present prices of the different classes of live stock there is no animal on the farm that requires as little care, and that will return larger



profits than will sheep properly cared for. It is estimated that under ordinary conditions the fleece of the ewe will pay for the feed for herself and a lamb, and when the small amount of labour is considered, it will be seen that the lamb crop is practically clear profit.

Care of Sheep

Contrary to the opinion of a great many, the care of sheep is not a very serious matter. The only time when special attention is needed is during the lambing period in the spring. The new born lamb, which is an exceedingly weak thing during the first few hours of its life, needs special care, and proper shelter should be provided at this time. This does not necessarily mean expensive quarters; a wind break and a shelter from rain and snow is about all that is necessary under ordinary conditions. All ewes with new born lambs should be removed to protected pens where there is plenty of room, and it is important to assist the young lamb to nurse the first time. Once it has been nourished there is comparatively little danger. It is a good plan to rub the young lamb briskly with a gunny sack or wisp of hay. Every effort should be made to provide ample food for the production of milk. An abundant milk supply is very important as far as the rapid growth of the young lamb is concerned. If the pasture is good it may not be necessary to feed grain to the sheep, but those who have a few good ewes and are anxious that the lambs make rapid growth before weaning time, generally feed a small quantity of grain. It keeps the mothers in better condition, and prolongs the milk flow. This is particularly desirable where the breeder is preparing to sell pens for breeding purposes and where he wishes to have them well grown and thrifty. Alfalfa is perhaps the best known roughage for sheep fattening. This with a combination of crushed oats and barley will make an excellent ration. The grain should be mixed oats and barley, about half and half to begin with, gradually changing to about one-quarter to one-third oats and the balance barley, toward the end of the fattening period. Wild hay and oat bundles may also be used to advantage. With the wild hay we would increase the proportion of crushed oats slightly in the ration, and with the oat bundles increase the barley slightly over that given above.

Sheep Fences

Loss from coyotes often prevents men from engaging in the sheep business. This is more particularly true in those parts of the Province where there is willow brush or small timber. In the more open prairie sections

sheep are not troubled by coyotes during the day, but it will be necessary to "fold" them in a coyote-proof corral at night. Ordinary hog netting 26 in. to 30 in. high, surmounted by three strands of barbed wire, will in most cases render the sheep pasture free from either dogs or coyotes. Care should be taken to have the woven wire touch the ground in all places. It is not necessary to have the whole farm fenced in this way, but simply those portions set apart for the sheep pasture. It is preferable that the sheep pasture should lie near the buildings, so that it can be seen from the house. In this connection a good sheep dog properly trained will be found invaluable.

Kind of Sheep for Alberta

Generally speaking, mutton is of more importance than wool in the west, therefore size is an important consideration. In addition to this, those breeds with the very open fleeces are not always desirable, since a storm may open up such a fleece and blow the snow particles directly against the body of the animal. For these reasons breeds that offer the largest size, coupled with compactness of fleece, are most suitable for Alberta conditions.



Oxford Downs, Vermilion Demonstration Farm

The Breeding and Rearing of Hogs

WITH the higher prices of pork in recent years, a large number of men have gone into the business of hog raising, and while many have had splendid success, there are others, not so favourably situated, who have encountered difficulties incident to the rapid development of such an industry in a new country. It has been proven beyond any question of doubt that pork can be raised with a very good margin of profit in this Province, but the margin of profit depends very largely upon the system adopted in rearing the hogs.*

The system of having two litters a year has not been very successful, and has often resulted in all or most of the winter litters dying, and if some do pull through, they are often so dwarfed and stunted that they are not profitable pigs to fatten. This Department is convinced that there are some well defined reasons for these losses, and that some of the losses at least can be prevented if proper methods are employed. If winter litters are born in a hog pen and kept there until weaned, the result very often is that the young pigs do well for the first three or four weeks, after which the hair begins to grow the wrong way, the pigs commence to wheeze and blow, and to drop off one by one. The trouble seems to be that the young animals will not



"Sweet Marie," a good type of Berkshire, Medicine Hat Demonstration Farm

take sufficient exercise during the cold weather to develop a healthy constitution. Then in the ordinary hog pen more or less dampness collects on the walls and ceiling of the building, and also in the bedding, consequently the young pigs get chilled, and no doubt die with pneumonia or other lung troubles. After trying unsuccessfully to raise winter litters in hog houses, the Demonstration Farms have adopted the system of straw sheds in the open. Various means have been used in constructing the sheds, but there has not been a great deal of difference in the result, no matter what method is used, as long as there is plenty of dry straw kept both beneath and above the pigs, and the shed is so arranged that there will be no draught. The roof of this shed should be about five or six feet from the ground, the width and length depending upon the number of hogs to be sheltered. While this method has not been in use very long, yet the results so far have been very satisfactory, and more definite conclusions can be given in another year. Some of the farmers of the Province have simply set the threshing machine beside a bluff, threshing several loads of straw over the bluff, and the pigs find their way beneath the straw, where they have dry, warm, healthy quarters. Everyone is not so situated that this method can be used.

The Demonstration Farms have experienced very little trouble in raising spring litters. In a few cases the young pigs came weak and very fat, occasionally without much hair. There is little doubt that this may be partly attributed to a lack of drinking water during the time the sow is carrying the young. In the severe weather the water is often so cold that the sow will not drink much. The result is that she becomes constipated, and more or less fevered, consequently the proper development of the young is interfered with. If, however, the drinking water is warmed, and some chop mixed in it, the sows will be found to drink all they require, and thus help to keep the digestive organs in good healthy condition, and consequently to improve the tone of the whole system. The remainder of the sow's diet should be composed of nourishing food, and at the same time food of a laxative nature. If roots are fed in liberal quantities it will greatly help to keep the digestive system in good order. Care should be taken with the grain ration to see that it is composed largely of ground oats and bran, very little barley being fed, except at the commencement of the gestation period.

Plenty of exercise is necessary for the sows during the breeding period, and there is no place better than a straw stack or a straw shed for them at this time. The sows at the Demonstration Farms are allowed to run in the feed lot with the steers. They are free to take exercise at any time, and they also have dry, comfortable quarters in the straw not eaten by the cattle.

The hog house, however, cannot be dispensed with entirely, as it is necessary to have pens in which to fatten or finish hogs for market, after they have been well grown. In building a hog house we would recommend first that the building be so constructed that it will be as dry as possible at all seasons of the year. In order to have a dry building the important requirement is ventilation. There is perhaps no better way to ventilate than to have a straw loft, and by this we mean to have the boards in the ceiling of the loft placed three or four inches apart, and on top of these to

have two or three feet of loose dry straw. This will allow ventilation, and will also absorb a great deal of moisture from the pens.

The young pigs are weaned at about seven or eight weeks old, depending on the size and condition. Before weaning they are allowed to feed in the trough with their mother, and a trough is also put inside a pen, to which the young pigs have access, the pen being so constructed that the old pig cannot get in with them. In this trough is fed sweet skim milk mixed with shorts, for a couple of weeks before weaning. After weaning, the sweet milk can be changed to water if necessary, and the shorts gradually changed to oat chop ground fine. When the spring litters are about three months old, they are turned on pasture of some kind, either rape or green oats and barley. They get all the water they wish to drink, and the oat chop is gradually changed to oat and barley chop mixed. When the hogs are well grown, say 150 pounds, they are put in pens, and fattened on oats and barley chop, two-thirds barley and one-third oats, mixed with water. The pigs which come later in the summer season are reared as mentioned above, but are placed in the steer corral about the first of November, and allowed to run with the steers until spring; sometimes it has been necessary to feed them extra in the steer yard, but in most cases they grow very well without getting any feed except what they pick up after the steers.

Three breeds of hogs are kept, namely Yorkshire, Tamworth and Berkshire. The majority of young pigs are sold to farmers at weaning time; the demand for Yorkshires and Berkshires is greater than we have been able to supply.



"Belmont Lady Olive" with her family of fourteen, Stony Plain Demonstration Farm

Farm Poultry Raising

THE choosing of a breed of poultry is a matter which should receive careful consideration. Certain breeds of fowl are adapted to certain conditions, and are suitable for certain markets. It is not possible here to discuss the merits of different breeds, but sufficient to say that, generally speaking, some of the dual purpose breeds give best results under ordinary farm conditions. Rocks, Wyandottes, Orpingtons and Rhode Island Reds, if selected for constitution, early maturity, length and depth of body, can be fed so that they will lay well, and when fattened they will make good table birds.

The housing need not be expensive. If the hen is worth \$1.50, and if there is an overhead charge of \$3.00 to \$5.00 in expensive equipment and building, it is impossible for her to pay interest on the investment, depreciation charges, cost of feed and labour, and to make a profit as well. What is necessary in housing is a building allowing each bird 5 square feet of floor space, 10 inches of space on the roosts, good ventilation without draughts, and all the sunlight possible. Where temperatures run as low as they do in this country it is necessary to have extra protection for birds during the coldest winter nights. A cotton curtain that will roll down in front of the roosts will afford this protection.

The house should face the south, and need not be more than $7\frac{1}{2}$ feet high in front, and 5 feet at the rear. The windows may be about 14 inches deep, and so arranged as to allow the sun's rays to reach the back wall. An earth floor is quite satisfactory, provided it is raised 6 inches higher than the surrounding ground. This filling should be dry, so that the birds may dust themselves during the winter. If frozen or wet ground is used in filling there will be more or less dampness as it thaws out, and as a result there will be trouble with colds and roup. If a quantity of sand and fine gravel is mixed with the ground used to raise the floor, the birds can obtain grit from this during the winter, and it will also help to keep the floor dry. Cut straw and cut green sheaves make a desirable litter, as the fowl will get a considerable quantity of green food from the leaves. In order to keep the litter fresh and dry it will be found necessary to change it every two or three days. The house should be fitted up with a shelf, about 18 inches high, on which hoppers of some kind are placed; one hopper to contain wheat and bran, another to contain two parts of oat chop, two parts of shorts, and one part of barley chop. This gives the birds an opportunity to select a variety of feed, and also gives bulk to the ration. The drinking trough may be placed on this shelf, also another hopper containing oyster shell or pearl grit, or in the absence of these, slaked lime.

It is wise to obtain eggs for hatching from hens rather than pullets, as the eggs are stronger in vitality, and usually larger. A few weeks before the hatching season commences it is well to select from the flock the best developed and best marked hens, known to be good layers, and then to secure a good male bird to mate with them. Feed them well with a variety of feeds, including green stuff or sprouted grain, but do not force them unduly to lay. Set eggs from these hens only. The remainder of the flock may be forced for egg production, and should not have a male bird with them, as the eggs will be in a much better marketable condition if infertile.



Barred Rocks, Stony Plain Demonstration Farm

When the hatching season is over it is well to fatten the hens and market them in June, when the price of dressed poultry is the highest. Thus you get rid of the older birds, and can use your space and time for the raising of the chicks. The pullets will lay the summer eggs.

THE CHICK

Given eggs of good size and strong vitality, the chicks should be strong, whether hatched by the hen or in an incubator. The chick when hatched should be placed on fresh ground, and given plenty of feed, including green stuff, grit and water. It is a good practice to smear the head, soon after hatching, with lard in which a few drops of coal oil have been mixed, in order to guard against head lice. This can be done once a week, until the chicks are about a month old. If the wings are growing too rapidly it is

wise to cut them back with a pair of scissors. Keep the chicks growing, and give as much room to range as possible. Bran fed dry from a hopper is one of the best foods for growing chicks.

PREPARING FOR WINTER

In the fall, as early as possible, prepare the winter quarters for the birds. Make three pens, one for the year-old hens, one for the pullets, and a third for the cockerels and birds that are to be disposed of. The cockerels and any pullets or hens that are off colour, or weak in constitution, can be fattened and sold. The pullets must be fed liberally to produce winter eggs, while the hens may be fed more sparingly in the fall and early winter, so that they will be in good shape to produce eggs of strong vitality for hatching purposes.

Pullets if fed properly will give good returns in winter, with eggs at the price fresh winter eggs are now bringing. It is quite possible to get eight dozen eggs per bird between November 1st and March 1st, and with eggs at 40c. per dozen a pullet properly fed and cared for should bring in between \$2.00 to \$3.00 before she is one year old.

SUMMARY

(1) Select a pen of the best year-old hens, and mate them with a good male bird to get your eggs for hatching.

(2) Keep all other male birds from the laying hens.

(3) Feed carefully and liberally a variety of feeds (including green feed), to all poultry, old and young.

(4) Fatten old birds, and sell them off in June.

(5) Fatten and sell all young cockerels and undesirable birds early in the fall.

(6) Feed pullets liberally for winter egg production.

(7) Winter quarters should not be expensive, but the house should be roomy, well ventilated, without draught or moisture, and with plenty of sunlight.

Growing of Corn

THE growing of corn in the Province of Alberta has not received any particular attention up to the present time. Several reasons at once suggest themselves for the lack of effort on the part of farmers to grow this crop. In the first place one must be prepared to admit that it cannot be grown as successfully here as in some of the Central States, or in the eastern part of Canada; again a large number of farmers have given most of their time to the growing of wheat, but since conditions are forcing people to a more intensive system of farming, some attention has been given in the last two or three years to the growing of fodder corn. As a larger number of farmers go into dairying we find a demand among them for more succulent feed than is provided by the feeds which have been grown up to the present time.

From the results already obtained on the Demonstration Farms of this Province it is evident that corn can be grown with sufficient success to warrant the growing of a larger area of this crop. For the past three years corn has been grown successfully on some of the Demonstration Farms, and also by a number of farmers throughout the country. On the Medicine Hat Demonstration Farm good crops of corn have been grown for three successive years. During the season just passed about seven acres were planted, and a very large amount of good feed was harvested. On the Sedgewick and Vermilion Farms about nine acres and four acres respectively were planted, and while this corn did not ripen nor cob as well as the corn on the Medicine Hat Farm, yet it furnished a lot of splendid feed, and was relished by the animals to which it was fed. All this corn reached a height of eight or nine feet, and yielded about eight tons to the acre.

With a short season such as we have in this Province the methods employed in growing this crop require most careful consideration. Perhaps no seed will lose its vitality more quickly in cold damp ground than will corn. The danger from this of course is intensified if weak seed is used, but no matter how strong may be the vitality of the seed, it is certain to suffer unless the weather is sufficiently warm to cause germination within four or five days after planting. Once the corn sprouts and comes through the ground an inch or two, it can stand a considerable amount of cool weather without materially injuring it. For some time, however, the crop is very tender and will be affected easily by late spring frosts, thus it is necessary to be reasonably sure that these late spring frosts are over before the plants have time to appear above ground.

The date for planting will vary somewhat in different sections of the Province, but for the greater portion we would say that corn should be planted from the 12th to the 20th of May. If planted earlier than this

there is a very great danger, either from late Spring frosts if the corn does germinate, or of the seed rotting in the ground before germination takes place. If planted much later than this it probably will be caught by frost at the end of the season before it has had sufficient time to mature. On account of the short season it is very necessary that we secure early maturing varieties. In choosing varieties for the Demonstration Farms the results of the experiments conducted at the Experimental Stations of Indian Head, Brandon, Lethbridge, Lacombe, and Bozeman, Montana, were used as a guide. Out of several varieties tested the following have been found to be most satisfactory, in the order mentioned: North Western Dent, Compton's Early, King Philip, Longfellow and Gehu. King Philip does not give quite as heavy a yield as the other varieties, but on the Medicine Hat Farm a considerable amount of this corn ripened sufficiently to be used for seed. If seed can be secured from corn grown in this country it will be possible to develop hardier and earlier maturing strains than if the same variety is brought from elsewhere.

PLANTING

Up to the present time the corn has all been sown with an ordinary grain drill. A sufficient number of spouts of the seeder are closed to make the drills 32 inches apart. It is almost impossible to sow corn thin enough when using the ordinary grain drill, but this matter can be remedied by going over the corn after it is up 6 or 8 inches, and cutting out the weaker plants with the hoe, thus thinning the corn down to a proper stand. By the use of the corn planter it is possible to do the work much more satisfactorily, planting the rows so that they can be cultivated both ways with a horse. This reduces the hand cultivation very materially, and at the same time gives a much better control of the amount of seed sown per acre. Not more than four or five kernels should be planted in one hill.

CULTIVATION

There is no ground on which corn will do better than on breaking, provided the breaking is properly done, and provided further that the land is well cultivated until the time the corn is sown. It is advisable to break 5 or 6 inches deep on the open prairie soil, and 8 or 9 inches deep on the heavier soil of the bush country. This land should then immediately be packed, double disced and harrowed, and after each rain, if there is time, disced or harrowed throughout the whole season. As early in the spring as possible this land should be again double disced and cultivated at short intervals until the corn is sown. It will contain a considerable amount of moisture provided this method has been carefully carried out; besides, there should be a good seed bed, with practically no weeds. If the ground is very loose, it would be well to pack after the corn has been sown.

As soon as the corn has appeared above the ground a light drag harrow may be used to destroy small weeds which have just germinated, and at

the same time to form a mulch to prevent evaporation of moisture. This harrowing can be continued very profitably at intervals of four or five days, until the corn is about 6 inches high. It may appear that the harrow is destroying a great many of the young plants, and no doubt it will destroy some, but the benefit to be derived from this harrowing will much more than counter-balance the destruction of a few of the plants. After the corn becomes too high to be cultivated with the harrow a horse cultivator can be used. This work should be done at least once a week throughout the growing season, and more often if time can be found. Provided the harrow and horse cultivator have been used as recommended, it will be found that very little hand hoeing will be necessary, particularly if the land is fresh breaking.

In cases where it is not possible to use fresh broken land for this crop there is no doubt that summer fallowing will give best results. The summer fallow land if well worked will not only be free from weed seeds, but should also contain more moisture than stubble land. The use of well rotted farm manure is strongly recommended whether the corn is planted on summer fallow or on breaking. This manure should be well worked into the soil the year previous to that in which the corn is to be planted.

CUTTING

It will be found sometimes quite satisfactory to use the ordinary grain binder when cutting corn, provided the crop is not more than 6 or 8 feet high; when it is over this height the binder will not handle it very well, and either a corn binder or a sickle will have to be used. Unless one has ten or twelve acres of corn it is doubtful whether it will pay to get a corn harvester. No matter what method is used in cutting, the object should be to get the corn cut as close to the ground as possible, as the corn stubble will give a good deal of trouble in ploughing and cultivating afterwards if it is left too long.

HARVESTING

Harvesting should be commenced at the time when the first early fall frost appears. If the corn is cut after the first night's frost there will be very little injury done on account of freezing, and unless the frost is fairly severe it will not be damaged to any great extent if left for three or four nights' frost. If a silo is not used the corn should be stooked in round stooks about 6 or 8 feet in diameter, and left standing in these stooks until required for feeding. When piled lengthwise either on the ground or in a barn it will commence very soon to heat and mould. This will greatly reduce its feeding value, and it will not be relished by the stock in the same way as if it were stooked in the field, where there will be no possibility of heating.

If one has satisfied himself that corn can be grown successfully in his district, and has come to a place where he is growing six or eight acres of corn each year, a silo will be found the most satisfactory method of storing.

On the Sedgewick Demonstration Farm a round stave silo, 15' x 24', was erected this year. About nine acres of corn, which yielded in the neighbourhood of eight tons per acre, were put into the silo immediately after the first night's frost. The silage is being fed to the herd of dairy Shorthorn cattle at the present time, and in addition to supplying succulence to the ration it greatly increases the palatability of the feeding mixture. This is a very valuable feed for the young growing calves, particularly when mixed with cut green sheaves and a ration of bran, chop and oil cake meal.

The silo is made of pine lumber, 2'' x 6'' x 24'. A cement foundation is laid in the ground about 8 inches, extending above the ground some 6 or 7 inches; the planks are placed upright on the foundation and are held in place by iron hoops, made with a nut and screw at each end, so that they can be tightened or loosened at the different seasons of the year, depending on whether the silo is full or empty.

It is quite certain that it will be some time before corn will be grown extensively in the Province of Alberta, yet in consideration of the results obtained on the various Government Farms in the Province, both Provincial and Dominion, and also of the results which a number of farmers have obtained on their own farms, this Department is justified in recommending the growing of this crop to every farmer who is in the cattle feeding business, and particularly those who are specializing in dairying. There is no crop that can be grown which will give such a bulk of feed, and at the same time feed of such a succulent nature.



Farm Yard, showing Silo, Sedgewick Demonstration Farm

Alfalfa in Alberta

UP to the present time the growing of alfalfa has been attended with some difficulty. Quite a number of farmers have sown small patches, but very few have had much success in getting a stand. An encouraging feature is, however, that some people have grown it successfully without irrigation, and while a favourable location and a soil particularly adapted may have contributed considerably to their success, yet it is evident that there are some well defined reasons which will account for a number of the failures, and if proper methods are employed the time is not far away when this crop will be grown successfully over a considerable portion of the Province.

During the past few years officials of this Department have given a good deal of time to investigating the growing of alfalfa, not only in this Province, but in other Provinces of the Dominion, and elsewhere. It has been discovered that the methods which apply to alfalfa culture in Eastern Canada, or in many parts of the United States, are not practicable in this Province.

As soon as the Demonstration Farms were established the Department commenced actual work with the growing of alfalfa. As there were six of these farms scattered over the Province about 150 miles apart, a splendid opportunity was given to investigate how this crop would succeed in various parts. Since most of the Demonstration Farms were raw prairie when purchased, the first two years had to be spent in getting the land in a proper state of cultivation to sow.

At Medicine Hat during the year of 1911 about eighteen acres of alfalfa were sown broad-cast, after the ground had been thoroughly prepared and inoculated. During the same year about one ton of hay per acre was cut. In 1912 and 1913 very little crop was harvested from this land, as apparently all the moisture had been sapped from the ground by the first crop. Early in July, 1913, this field was drilled with a common walking plow, and after about two months rows of fresh, healthy, green alfalfa came up along the centre of each drill. It is the intention to cultivate with a horse cultivator between the drills during the coming summer.

In the season of 1912 about five acres of alfalfa were sown on each of three farms, namely at Medicine Hat, Vermilion and Sedgewick. The Sedgewick alfalfa winter killed entirely, and while the Medicine Hat and Vermilion alfalfa came through the winter, yet it could not be considered a good stand. Upon investigating further the Department arrived at the conclusion that the only sure way of getting a stand was to sow the alfalfa



in drills about 32 inches apart, and to cultivate with a horse cultivator throughout the growing season; consequently, last year most of the alfalfa sown on the Demonstration Farms was put in drills, using three pounds of seed per acre, and every field went into the winter in first class condition. On the Olds Demonstration Farm about five acres were sown broad-cast on land which had been specially prepared. After being thoroughly summer fallowed the previous season and ploughed about 10 inches deep, a heavy coat of well rotted manure was applied. This manure had previously been mixed with slaked lime. The ground was well inoculated with soil from a field on which alfalfa had been grown, and about the middle of June Grimm alfalfa was sown at the rate of eight pounds per acre. This crop also went into the Winter in a very healthy condition.

Experience leads us to believe that, on account of the hard nature of a great deal of the sub-soil, the use of a sub-soil plough will be found of great advantage in loosening the under soil, so that the roots can penetrate easily. During the coming season it is the intention to sub-soil to a depth of 14 or 15 inches all land on which alfalfa is to be sown. By sowing in drills and cultivating between the rows it will be possible to keep down the weeds, and to conserve much moisture which would otherwise escape.

Very keen interest is being taken by many of the farmers throughout the Province in the work which the Department is doing with alfalfa, and while there are no striking results to report up to the present time, yet it is felt that the work done so far is sufficiently encouraging to warrant giving more effort to solving some of the problems connected with the growing of this crop.

Financial Statement

The following statement of the operation of the Demonstration Farms for the year 1913 indicates the results for twelve months' operation. The cash receipts show pretty clearly the value of the dairy cow to the Alberta farmer as a source of revenue from month to month. Considering the difficulties of Government farming and that this is really only the second year of operation, the results may be considered very satisfactory. It will be noted that the operating expenses include the value of feed purchased for the feeding of beef steers, and in fact the entire expenditure, not only for work, but for outlay of every kind in connection with a year's operation of the seven farms. No revenue was received this year from the Athabasca farm.

Financial Statement of the Demonstration Farms for the Year 1913

Debit

Operating expenses.....	\$52,408.74	
Value of Feed, Seed, etc., grown on farms and on hand		
December 31st, 1912.....	16,746.75	
Value of increase in Live Stock for the year 1912....	3,689.00	
Depreciation of Live Stock:		
Horses.....	\$ 954.30	
Cattle.....	1,640.00	
Hogs.....	32.50	
		2,626.80
BALANCE.....		6,711.36
		\$82,200.65

Credit

Revenue:

Dairy.....	\$26,201.59	
Roots and Vegetables.....	73.61	
Wheat.....	2,496.08	
Oats.....	221.45	
Barley.....	663.80	
Poultry.....	358.88	
Steers.....	11,895.71	
Hogs.....	2,910.19	
Sheep.....	87.80	
Green Feed.....	.50	
Horses.....	360.75	
		\$45,270.36

Appreciation of Live Stock:

Horses.....	\$ 2,255.00	
Cattle.....	14,223.00	
Hogs.....	1,940.82	
Sheep.....	264.56	
		18,683.38

Value of Feed, Seed, etc., grown on farms and on hand		
December 31st, 1913.....	18,246.91	
		\$82,200.65



Set of Farm Buildings Erected on Each Demonstration Farm

Financial Statement of the Demonstration Farms

Rotation of Crops

ROTATION of crops has been advocated since time immemorial as being an essential to successful agriculture. Virgil and Cato advised rotations of one sort or another, and at the present time a systematic rotation of crops is considered by all the best authorities absolutely necessary to good agriculture. In spite of these facts, however, the data collected by the Conservation Commission reveals the disappointing condition that scarcely one per cent. of the farmers of the western provinces follow what may be called systematic rotation of crops.

It is better in discussing this subject to differentiate between a "rotation" and a "systematic rotation." A rotation too often means that crops follow one another in a certain order and without consideration of the peculiarities of crops and soil. A systematic rotation, however, is one in which each year, while a crop is being grown, the land is being fitted for the crops of the following years. By this we note that a systematic rotation of crops tends to have each year's crop working for the betterment of the succeeding ones—working together, as it were, the one helping the other.

At the basis of all genuine rotations lies the fact that plants differ from one another—they differ from one another in their demands upon the soil, both chemical and physical; they differ with regard to their root systems, depth of feeding, their moisture requirements, their time of feeding, and their time of maturity.

Many plants impoverish the soil; a few enrich it; some spoil its physical condition, while others improve it in that regard. Many crops favor the growth of weeds, while others either are able to hold the weeds in check or require such cultivation and treatment as will prevent their growth.

All these differences fit plants for different places in rotation, and a well arranged rotation is one in which the strong points of one crop make up for the weak points of another and in this way reduce deficiencies to a minimum. A crop that requires a large amount of one kind of plant food should be followed by one that requires less of that plant food and probably more of another kind. A shallow rooted crop should be followed by one that is deeper rooted, so that the plant food which may have escaped the shallower roots may be caught by the deeper feeders, and that the nutrients in the soil may be used to a greater depth and not allowed to leach away. Crops that draw heavily on the soil should be followed by a so-called soil-restorer, and crops that are conducive to the growth of weeds should be followed by a weed-destroying crop.

Among the soil restorers mentioned above are the leguminous plants, which include alfalfa, clovers, beans, peas and vetches. These, by means of nodules on their roots, are able to make use of the free nitrogen of the air (which to other plants is unavailable) in building up the plant. As nitrogen is the element most likely to be present in insufficient quantities, and since it is the most valuable in building up plant and animal tissue, this is a very important asset. Hence a leguminous crop should be grown as often as possible in a rotation. Apart from the fact that legumes enrich the soil in nitrogen, some of them have deep feeding tap-roots, which make use of the subsoil to a considerable depth for obtaining their mineral elements, and also any other plant food that may have reached below the depth of ordinary plant roots. Then, when these roots decay, a large amount of these minerals and other elements are left in the top soil, which will now be of the very best texture.

Rotations are also very intimately related to the weed problem. A crop of any kind always favors the growth of weeds whose habits are similar to its own, especially if the weeds ripen rather early and shed their seeds on the ground. From this we see that, on this account alone, it is most important not to grow one crop continuously. By means of a rotation, where crops of different habits follow one another, this will not occur, and if a hoed crop is introduced into the rotation at regular and fairly frequent intervals, little chance is left for weeds to establish themselves, providing that fence corners, ditches and sloughs, stone piles, roadsides and such like are kept free from weeds, and that weeds are not introduced through seed or otherwise.

Systematic rotation of crops hinders the growth and spread of insect and fungus diseases. As in the case with weeds, these have certain life habits which they must follow in order to live and thrive, and if this life habit is interfered with they are checked in their development or killed altogether. It is because rotation upsets the life cycle of insects and fungus diseases that it is beneficial.

Another advantage of rotation is that it furnishes the farmer with the variety and kind of feeds that are necessary to the successful feeding of live stock. Furthermore, a rotation distributes the labor throughout the entire season and in this way ensures more efficient and more economical hired help, because the farmer may retain a good man the year round.

Other advantages in favor of rotation would be: first, revenue on the farm would come from a number of sources and not from grain-growing alone; second, an expensive summer fallow, which costs the farmer one year's crop, six to eight dollars for cultural operations, and as much plant food as is removed by two crops of wheat, may be avoided.

What is now known as Central Alberta is often described by the general term, "brush country." Here climatic and soil conditions are such as to offer a most desirable country for mixed farming. For this district some such rotation as follows, modified or expanded to suit particular cases, is suggested:

1st year—Hay.

2nd year—Hay, two tons per acre, or pasture; manure in autumn.

3rd year—Pasture or hay; break and disc in July or August.

4th year—Wheat or oats (fall plow).

5th year—Oats (fall plow).

6th year—Hoed crop or green feed.

7th year—Barley; seeded down—Timothy, 2 lbs.; Western Rye, 2 lbs.; Alsike, 3 lbs.; Red Clover, 3 lbs.

The Importance of Moisture Conservation

THE Eastern Canadian and American farmer is trained to look upon “fertility” as the keystone to the whole question of successful farming and, keeping that in view, shapes his whole year’s work to the end that he may keep up the store of fertility in his land. He is right in doing so, as he never has had to take into consideration the amount of moisture needed to grow successful crops, because on an average nature supplies an abundance.

The Western Canadian farmer is working under altogether different conditions. His average rainfall is only about half that of his eastern brother, and having a virgin soil full of plant food, he has not to consider fertility in the same way. His most difficult problem is to obtain all the moisture he would like to have for his crops. In view of this and the fact that all plant food taken from the soil is taken up dissolved in water, the amount of moisture available for his plants becomes a most, if not the most, important problem. This being the case let us look at some of the farm work with the thought of the moisture conservation as the controlling one. Let us set up moisture conservation as the keystone of the arch of successful agriculture in Alberta and see how it affects the situation.

Distribution of the Rainfall

The first thought then is the necessity for studying the rainfall, when it comes and how much. The following table shows the annual precipitation for the seven years, 1903 to 1909, averaged:

TABLE SHOWING ANNUAL PRECIPITATION FOR SEVEN YEARS
1903-1909

	Medicine Hat	Lethbridge	Macleod	Pincher Creek	Calgary	Gleichen	Three Hills	Wetaskiwin	Edmonton	Prov. Average
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January	0.43	0.72	0.56	0.80	0.33	0.29	0.71	0.86	0.96	0.62
February	0.31	0.47	0.28	0.46	0.28	0.23	0.44	0.72	0.55	0.41
March	0.46	0.72	1.05	0.71	0.74	0.27	0.67	0.99	0.86	0.72
April	0.32	0.84	0.85	2.09	0.80	0.49	0.52	0.50	0.63	0.78
May	2.37	3.35	2.83	3.86	3.62	2.82	2.51	1.59	1.74	2.80
June	2.09	2.83	3.40	1.91	3.61	4.04	3.89	4.03	3.97	3.53
July	1.14	1.27	1.39	3.63	2.08	2.49	1.99	3.07	3.00	2.28
August	1.11	2.07	1.44	2.27	2.94	2.36	2.23	2.00	2.21	2.17
September	0.50	1.08	0.80	0.87	0.90	0.50	0.93	1.25	1.05	0.97
October	0.41	0.81	0.49	0.62	0.56	0.67	0.66	0.50	1.02	0.66
November	0.26	0.50	0.44	0.43	0.38	0.25	0.50	0.78	0.92	0.50
December	0.42	0.47	0.43	0.20	0.22	0.24	0.66	0.79	0.57	0.51
Totals	9.82	15.13	13.96	17.85	16.46	14.65	15.71	17.08	17.48	15.95

Annual Precipitation of—Ontario	Average 26 years	31.62
New York State	Average 23 years	27.80
Missouri	Normal	40.71
Iowa	Average 19 years	31.71
Ohio	Average 21 years	39.20
Alberta	Average 7 years	15.95

This shows a comparatively light rain and snow fall the first four months of the year, with heavy falls the second four months, i.e. May, June, July and August, and again light during the closing four months of the year. Generally speaking 60 to 65 per cent. of our total precipitation occurs during the growing months. This gives the rain when the crops are on the land, when the plants can make the most use of the moisture and with least leaching of plant food.

The light precipitation during seeding gives favourable conditions for work without interruption and an opportunity for the land to warm up quickly. The light rainfall of September and October presents ideal conditions for harvesting and threshing large crops of grain without the necessity of housing in barns. The light rain and snow fall in the winter when the land is frozen means favourable conditions for live stock.

Any great variation from the condition given above interferes with successful crops. If the heavier rains are delayed in the spring, droughty conditions appear. If carried over into September growth is not checked,

so that ripening can take place, and harvest is delayed with danger of frost. If continued, so that harvesting is interfered with, much of the grain may not be threshed before winter sets in.

The rainfalls of the years succeeding those tabulated above do not change appreciably the general character of the results or the lessons to be deducted therefrom. Owing to heavy rains late in the summer the averages for the months of August and September are slightly increased. A study of the table then shows how intimately the rainfall is connected with our farm operations.

Breaking

Did you ever see a piece of breaking lying for weeks just as it was ploughed, all kinks and unevenness, allowing the furrow slice to dry out as well as the land under it? The underlying idea in breaking is to rot the sod. This requires moisture, therefore the natural moisture in the land should be retained by pressing the overturned furrow slice down on the under soil, by smoothing out the kinks and unevenness as much as possible so as to conserve moisture to assist in rotting the sod, and then working up as good a dust blanket on top as possible to further check evaporation. Men have tried all ways of getting rid of prairie sod. The sod has been cut into small pieces by numerous applications of the disc harrow, but the pieces exposed to the air did not rot. They dried out and knocked round the field until finally ploughed down so they could rot. Once we get the right idea about moisture and its relation to the rotting of sod, breaking will be accomplished more easily and effectually.

Weeds

The light rainfall gives the reason why weeds are so troublesome. The dry falls, so ideal for harvesting and threshing, are equally favourable to the preservation of the weed seeds that fall on the ground. There is not sufficient moisture to cause them to germinate and thus destroy them. Their hard, strong or oily coats protect them during the fall and winter, and they are ready for germination in the spring. Even if ploughed down in the fall they only lie in the ground, carefully preserved it may be for years, until they meet with conditions of air, warmth and moisture favourable for germination. The situation is made more serious because of the large areas sown to grain year after year. The one crop method of farming gives those weeds, whose period of growth fits in with that of the grain, a very favourable opportunity to grow. Because of these conditions the prairies have the most stringent weed laws of any of the Canadian provinces.

The destruction of weeds must always be studied in connection with rainfall, the great aim always being to present conditions that will cause the seeds to germinate (which takes moisture) and then kill them when small by cultivation. The weed situation can be met best in connection with a study of moisture conditions.

The Summer Fallow

Keeping in view the thought started with, the chief aim in a summer fallow should centre round the conservation of moisture. This can be done, at the same time obtaining all other benefits desired. If ploughed deeply, great storage space will be provided to take care of all rains, and weed seeds in the surface soil can be germinated and killed. But the surface soil thus cleaned of weed seeds should not be ploughed down as is done sometimes, and fresh soil full of seeds turned up in which to grow next year's crop.

Another purpose of the summer fallow is to liberate plant food through bacterial and chemical action. These actions require certain conditions of air, moisture and temperature, and are frequently curtailed because of the lack of moisture. Hence the earlier sufficient moisture for them is present in the soil, the more prolonged will chemical and bacterial liberation be maintained. It is only necessary to call attention to this thought to see how in many ways the work of the summer fallow could be slightly altered to meet the new view point and make the work more effective.

Grass Seeds and Catch Crops

Successful seeding with grass seeds and catch crops is closely associated with the amount of moisture in the soil and timely rainfall. Methods successful in more moist climates are not always applicable here, as many have found to their cost. Moisture conditions must be the first consideration, and especially so because these seeds are small and cannot be buried deeply. Hence usually the most successful time to seed is close to or during the period when the greatest amount of moisture is falling.

Manuring

If a good coating of manure is applied in the ordinary way and ploughed down, the land is held too open and dries out too quickly, the manure is liable not to rot, and a poor crop results. Under such experience it is no wonder that the idea has become general that it ruins the land to add manure. Hence it is used for roads, and the stables sometimes moved in preference to drawing away the manure. Here again, by studying moisture conditions, a way to add manure can be found. If spread on the land during the winter the manure will catch and hold snow, retard the thawing out of the land in the spring, and act as a mulch in retaining moisture once it has thawed out. By the time other seeding is done this land is ready to be ploughed for a crop of green feed or barley. Most of the manure is moist and the strawy part is not too dry to plough down. The season of greatest rainfall is also at hand to assist the land in rotting the manure without damage either to itself or the crop that may be on it. In this way large quantities of manure have been applied with wonderfully successful results.

The foregoing is sufficient for the purpose of this article, to illustrate how importantly the supply of moisture enters into some of the larger operations of the farm, and hence the necessity of giving the conservation of moisture the chief place in our thought in connection with all matters pertaining to the soil. Just as the eastern farmer has set as his watchword "maintenance of fertility," so the western farmer should set as his, "conservation of moisture," and should study how it enters into every phase of his work on the land.

Seed Vitality

GERMINATION TESTS

THE object of the germination test is to determine what percentage of proposed seed may be relied upon to fulfil nature's plan of reproduction. To the farmer this is a most important consideration, and yet in perhaps no other field is so little forethought shown. It is safe to say that as yet but a small percentage of grain sown has been subjected to a vitality test previous to seeding. The field is carefully prepared, perhaps summer fallowed; the skies are anxiously scanned to read the weather probabilities, the supposedly proper amount per acre is carefully sown, and all the demands of cultivation met, as a matter of course; and yet the seed, the central figure of all these operations, is so often an unknown quantity to the agriculturist. It is easy to say that 90 lbs. of wheat to the acre is plenty, but it would mean a great deal more if we stipulated that this 90 lbs. would germinate 98% to 100%, or, failing this standard, that sufficient seed be sown to make up for the deficiency. In this lies the value of the germination report—that the farmer may know what percentage of the seed he may depend upon, and then, as a consequence, how much he should sow per acre to secure the desired stand.

Germination tests are made in various ways. There is the soil test, where soil is placed in boxes and a certain number of seeds planted and the percentage of vitality determined by the number of seeds sprouted. This method is all right for a few samples, but it is open to the objection that temperature is often not under control. Germination requires moisture, proper temperature and ventilation, and no fair test of seed vitality can be made where there is a lack in any one of these factors. Next there is the blotting paper test, where a wet sheet of blotting paper is folded over the seeds and moisture maintained between plates. Here also the test is subject to the variations of room temperature. However, if a farmer or dealer does not care to send samples to a laboratory, either of the foregoing schemes is much to be preferred to no test at all.

In laboratories they have standard germinators in which an attempt is made to secure as nearly as possible ideal growth conditions. Artificial heat from burners or electric bulbs raises the temperature to the desired degree. Blotting paper and cheese cloth maintain the moisture through capillary action, and there is plenty of ventilation. In these germinators seeds are always tested in duplicate to prevent possible error. In four days a count of sprouted seeds is made, and all that have germinated are removed. This count is probably the most important one since it shows the readiness with which the seed responds to growth conditions. Later counts are made in seven, ten and possibly fourteen days, the sprouted seeds being removed each time. The aggregate of all the counts gives the final report made upon the seed.

The standard germinator, properly handled, gives the most uniform and reliable results as to seed vitality. However, it must be remembered that these results are dependent upon most favorable conditions, and since these are not always, or often, obtainable in field germination, allowance should always be made. Following are some facts that have a distinct bearing on indoor germination:—

(1) Wheat germinates readily. Wheat apparently damaged greatly by frosting may yet germinate over 80%. This does not minimize the importance of the injury. This seed, if subjected to unfavorable field conditions, cannot give a uniform and vigorous stand equivalent to 80%. Here the eye must assist in estimating the value of the germination report.

(2) Oats are often slow of germination, and this quality varies with the variety to some extent. Age of oats is an important factor, since oats that will germinate less than 60% two months after threshing may be found to germinate 90% in six months. The same characteristic has been noticed, at times, with barley.

(3) If there is reason to think that oats are frosted, and if at the same time the germination report is low, the poor quality of the seed is established beyond reasonable doubt.

(4) An impression, somewhat popular, is to the effect that soil tests are more reliable than artificial germination, so called. There is no foundation for this idea unless it lies in the fact that since the seed is subjected to comparatively unfavorable conditions in the soil, field conditions are more closely approximated. On the other hand, soil tests may be conducted under such unfavorable room conditions as to give a result most unfair to the seed tested. Conditions being equal, there is, for all practical purposes, no difference in results in the three methods—subsequent plant growth is altogether another question.

The Schools of Agriculture are each equipped with a good germinator to test samples of grain sent in by farmers who care to avail themselves of this service.

FROSTED SEED

Possible injury to seed vitality by frosting is an anxious question with very many western farmers. From the examination of samples submitted, from results of germination tests, and from a study of the information accompanying the samples, the writer has been enabled to come to the following conclusions in regard to frosted seed:—

(1) Injury, often readily apparent to the eye, is regulated in severity according to the state of maturity of the grain at the time of the frost. For instance, wheat, if it shows injury at all, may show only a checkered cracking of the seed coat which gives a sort of cloudy appearance to the characteristic tint of the seed. Apparent injury ranges from this extreme down through several shades of shrunkness, to where the wheat will weigh less than 30 lbs. to the bushel. Almost without exception the stage of maturity at time of frosting gives consistent explanation of the degree of shrunkness observed.

(2) Date of cutting appears to be another modifying factor. Many inquiries have been made as to comparative injury to stooked and standing grain of the same crop. All evidence collected goes to prove that grain cut and stooked shortly before frost, threshes a better sample than grain that has been allowed to stand. Of course reference is made to grain that is fairly well on toward maturity.

(3) Comparative local elevation affects the percentage of frost injury. For instance, grain growing in slough bottoms and even in furrows is often nipped when the rest of the field escapes injury. Particularly is this noticeable with flax. Probably the comparative stage of maturity due to the difference in elevation also contributes to render the lower grain more susceptible to injury.

(4) Frost injury to wheat is indicated by a cracking of the seed coat and by more or less shrinkage. There is also a reddish discoloration at times. The degree of injury can be pretty well diagnosed by the use of the eye alone. The germination test is misleading, because the frost injury does not seem to destroy germination power to the extent one would naturally expect. This is of interest to those who have damaged wheat which they fear to sow but which they are not in a position to replace by better seed. A fair percentage is certain to germinate, the amount depending on the favorable or unfavorable weather conditions obtaining after seeding. The serious character of the injury lies in the poor start that shrunken seed must of a necessity give to the young plant. Many claim that this influence is negligible, but some years of experiments with small seed, broken seed, and last year with frosted seed, show that the injured seed, while it may germinate, cannot produce a stand as vigorous as when plump healthy seed is sown. In last year's experiments the average germination of uninjured wheat was over 98% while the average germination of frosted wheat was over 81%. Sown in plots the comparative stands scored 92% and 47%, of final estimate.

(5) Frost injury to oats is not readily apparent to the eye, and indeed it may be so little apparent as to cause spirited arguments as to its literal presence. It may as well be stated at the outset that no judgment should be given until the hull is removed. It is the popular plan to take a knife and cut the oat longitudinally. If a discoloration is found along the inner side of the bosom of the seed, it is declared frosted. After having carefully examined several hundreds of samples in search of evidence of frost injury the writer would not care to make an emphatic decision in certain cases. The discoloration just mentioned may be evidence of frosting and it may not. Samples of grain from Ontario show this discoloration when there has been no possible chance of frost injury. Perhaps excessive moisture may have been the cause. Hold the seed up to the light; a dark spot at the middle of the seed or toward the end is a pretty sure sign of frosting. Break the seed over the thumb nail; normal seed is rather pliable, but brittleness is a characteristic of frosted oats. The frosted seed tastes "oldish and sweetish," as one has styled it. The opaque spot in the seed is often large, and then the bosom of the seed is generally shrunk, giving the seed a rather flat appearance. A low germination test should tend to make one very suspicious of frosting. It is true that some varieties of oats seem to be slow in germination if tested shortly after threshing, but, as already stated, a low percentage of germination, where frosting is suspected, is apt to be strong evidence of such injury.

(6) Discoloration of barley is said to indicate frosting and it is true that such darkening or yellowing may be caused by frost. However, it is known how rain or even dew will affect the color of barley, so one must not jump at conclusions. Lack of plumpness associated with a low germination test would indicate probable frost injury.

(7) Flax that has been caught by frost before maturity will show a whitening of the seed coat, generally over only part of the seed. The amount of surface so bleached is a pretty fair indication of the extent of the frost injury. Most depends upon maturity. Ripe flax was subjected to three alternate thawings and freezings after being soaked for a short time in water. The seed so treated germinated about as well as seed from the same sample that had not been so exposed. On the other hand, seed that showed bleaching showed also a corresponding falling off in germination power.

From what has been said in the foregoing one can readily deduce the fact that the securing of early maturity is the chief factor in avoiding loss from frosting. Also it seems clear that frosting causes deterioration in the quality of the seed, unless the seed has been able to ripen; that in the case of wheat and sometimes in the case of other seed the appearance of the seed should be considered along with its reputed germination power. In this country where unseasonable frosts sometimes occur, a study of the effect of such frosts upon seed, is very much to the purpose.

Alberta Schools of Agriculture

AGRICULTURAL education in Alberta is based upon a system differing somewhat from that hitherto in vogue in other Canadian Provinces. A scheme founded upon the principle of the People's Schools of the Old Country, modified to suit conditions here, has been put into practice, from which it is expected that the needs of the farmers' sons and daughters can be best met, and by which the greatest amount of service can be given those who engage in the profession of agriculture. Instead of beginning with a Provincial Agricultural College, the Department of Agriculture, after a careful consideration of results in other lands, deemed it wise to carry instruction nearer to the homes of those whom agricultural education is intended to reach. The plan in brief was to establish on each Demonstration Farm a School of Agriculture which should have as its prime object the education of young men and young women who would, after taking the course, return to the farm.

In 1913 three such schools were built, equipped and put into operation. The school at Claresholm was intended to serve that portion of the province south of the Canadian Pacific Railway line through Calgary; the school



School of Agriculture, showing Mechanics Building



The Board of Agricultural Education at its First Session

at Olds was considered as belonging to the central part of the province, while the school at Vermilion was to draw its students from the northern portion of Alberta, as settled at the time. Thus the boys and girls had comparatively easy access to institutions of agricultural education. Nor was this the only consideration. It was anticipated that the young people would more readily attend smaller schools, situated under rural conditions, and where board and lodging could be obtained at more reasonable rates than would be the case with a large college in a large town. The schools were to offer a two-year course in Agriculture and Household Science, each term to extend from about November 1st to March 31st, five months which constitute the slack period on the farm in the west. The first term has just closed and it is the purpose of this report to outline the work given during the term and to give a general statement as to results.

BOARD OF AGRICULTURAL EDUCATION

The following extracts will explain how the Board is constituted and the purpose for which it has been established:

"An Act respecting Schools of Agriculture (Chapter 11, 1913).

"Clause 7.—There shall be and is hereby constituted a Board of Agricultural Education to be composed of nine members, three of whom shall be graduates of an Agricultural College, to be appointed by the Lieutenant Governor in Council"

"Clause 15.—The Board, together with the Minister, shall prepare the scheme of practical and scientific work to be done by students attending each and every school, shall prescribe the course of study, appoint examiners, and shall in addition be an advisory Board to aid the Minister in all agricultural educational work."

The Board of Agricultural Education, which has drawn up and supervised the Course of Study in the Schools, is composed of men well known in agricultural and other educational fields. The fact that the Course of Study in the Schools is in their hands should be a guarantee of the practical, common sense work for which the Schools must stand. Following is a list of the Members of the Board:

HENRY MARSHALL TORY, D.Sc., LL.D., F.R.S.C., Chairman.
JOHN GUNION RUTHERFORD, V.S., C.M.G., Vice-Chairman.
JAMES MURRAY, B.S.A., Suffield.
ERNEST LAMONT RICHARDSON, B.S.A., Calgary.
JOHN HECTOR McARTHUR, Milnerton.
JOHN CLIMIE DREWRY, Cowley.
BRYCE WRIGHT, De Winton.
FREDERICK WEST, Vermilion.
DANIEL WEBSTER WARNER, Edmonton.

COURSE OF STUDY

In arranging the course of study two things have been kept chiefly in mind: First, to give highest consideration to the needs of the boys and girls who purpose returning to the farm and, second, to put on, as a consequence of the first condition, work which is essentially practical. The schools may be said to specialize in four departments: Field Husbandry, Animal Husbandry, Farm Mechanics, and Household Science. As far as possible, and consistent with the intent and purpose of the scheme, the course is made to conform with the courses laid down for the first two years in older agricultural institutions. Thus, due attention is paid to chemistry, physics, geology, botany, horticulture, mathematics, and English. The two latter studies are given considerable attention in view of the fact that many of the students have had but little common school education and that the Schools of Agriculture present probably their last opportunity to receive instruction in these essential subjects. A comparative summary of the whole work may be given in brief—in the majors just mentioned, Alberta's schools give more matter and wider practice than is offered in the first two years of a regular college course, but, owing to a smaller staff and fewer facilities, less detailed work can be given in those subjects which may be called minors in such a course. Following is a brief outline of what has been taught in each school during the term just closed:

Field Husbandry

(1) **THE SOIL.**—Kinds of soil, their origin and properties; different methods of cultivation; irrigation and dry farming as pertaining to the province.

(2) **THE PLANT.**—General structures; relation to air, moisture, heat and light.

(3) **FARM CROPS.**—Their history; nature; culture; adaptation to Alberta conditions.

(4) **SEED.**—Work with the score card; comparative judging and grading; germination tests; purity tests.

Animal Husbandry

(1) Necessity of live stock in good farming.

(2) Breeds.—History; classification; characteristics; adaptability.

(3) Feeds and Feeding.

Veterinary Science

Structure and functions of the animal body; common ailments of farm animals, diagnosis, treatment and prevention; simple surgery; care of animals; stable hygiene.

Farm Dairying

Milk production; market conditions; keeping of records; butter making; cheese making.

Poultry

Breeds best adapted to Alberta conditions; egg production; incubation; care; feeding; marketing.

Farm Mechanics

- (1) Mechanical drawing.
- (2) Woodwork.
- (3) Blacksmithing.
- (4) Building.
- (5) Cement

Horticulture

- (1) Floriculture.—Culture of flowers and bulbs for house and garden.
- (2) Vegetable Gardening.—Staple garden vegetables—planting, cultivation, harvesting and storing.

Elementary Science

- (1) Physics.—The fundamental principles.
- (2) Chemistry.—Elementary principles of chemistry and their relation to agriculture.
- (3) Geology.—Formation of the earth and movement of soils.
- (4) Botany.—Parts of plants, their forms and uses; food supply of plants; pollination; identification of weeds and weed seeds.

Farm Management

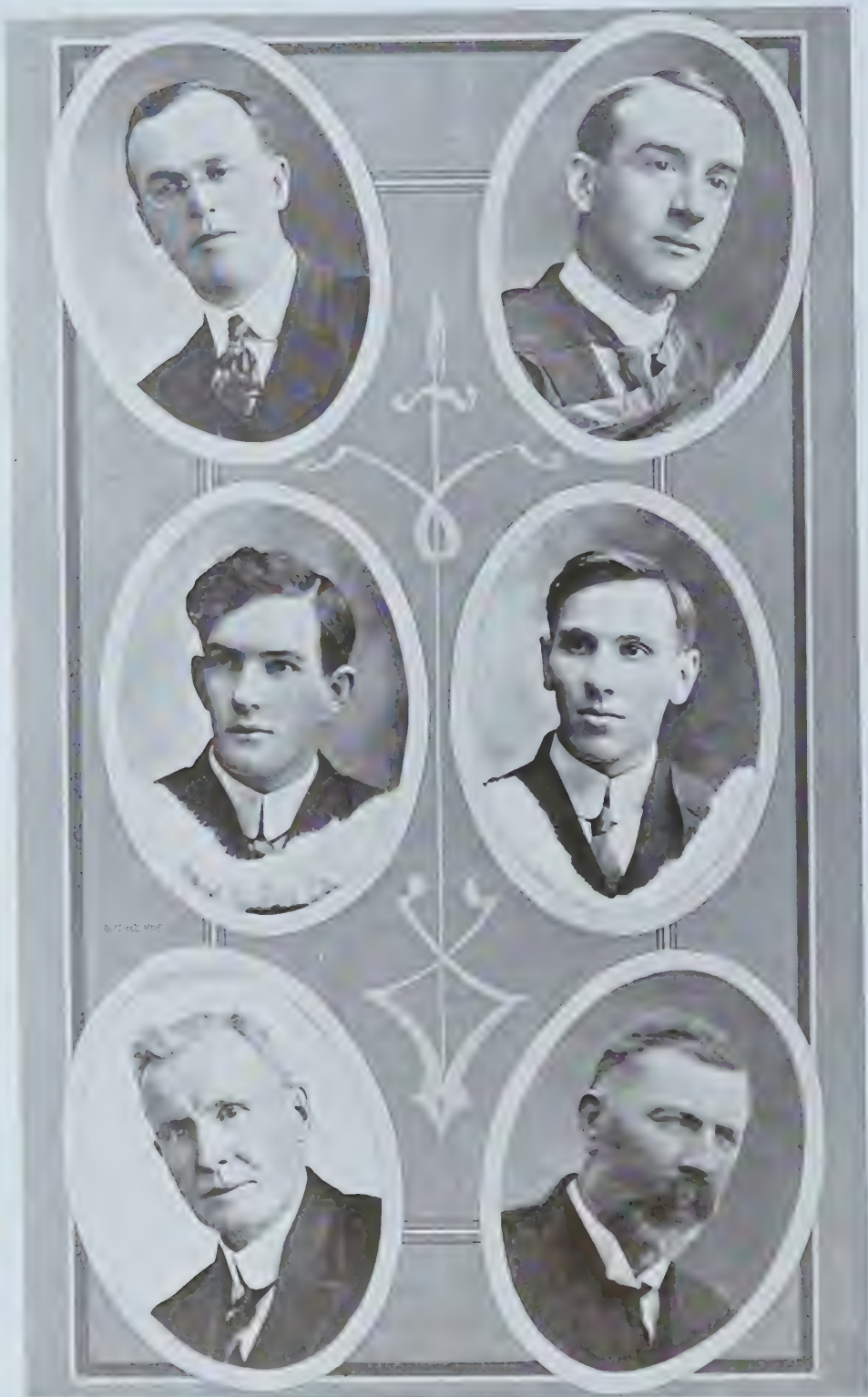
The whole purpose of this course is to show how to run in a common sense way a western farm, following mixed farming methods.

English

- (1) English composition.
- (2) Dictation.
- (3) Public speaking—debates.

Mathematics

Arithmetic.—Practice in simple rules; commercial arithmetic; mensuration.



CLARESHOLM

W. J. Stephen, Principal, School of Agriculture
P. M. Abel, Instructor, Animal Husbandry
H. S. Pearson, Instructor, Farm Dairying

J. C. Hooper, Instructor, Elementary Science
O. S. Longman, Instructor, Farm Mechanics
J. H. McNally, Mgr., Demonstration Farm



Students only, Claresholm School of Agriculture



Teachers and Students only, Olds School of Agriculture



OLDS

W. J. Elliott, Principal, School of Agriculture
M. M. Goldie, Instructor, Household Science
G. R. Holeton, Instructor, Farm Mechanics

F. Grisdale, Instructor, Field Husbandry
N. Lawson, Assistant, Household Science
J. Fowler, Instructor, Elementary Science

Teaching Staff

Claresholm School

WILLIAM JOHN STEPHEN, B.A., B.S.A.,
Principal and Instructor in Field Husbandry.

PETER McDONALD ABEL, B.S.A.,
Instructor in Animal Husbandry.

OLIVER STANLEY LONGMAN, B.S.A.,
Instructor in Farm Mechanics.

JAMES CRAWFORD HOOPER, M.A.,
Instructor in English and Elementary Science.

Olds School

WILLIAM JAMES ELLIOTT, B.S.A.,
Principal and Instructor in Animal Husbandry.

FRANK SYDNEY GRISDALE, B.S.A.,
Instructor in Field Husbandry.

GEORGE RICHARD HOLETON, B.Sc.,
Instructor in Farm Mechanics.

JAMES FOWLER, M.A., B.Sc.,
Instructor in English and Elementary Science.

Vermilion School

ERNEST ALBERT HOWES, B.S.A.,
Principal and Instructor in Field Husbandry.

JAMES GORDON TAGGART, B.S.A.,
Instructor in Animal Husbandry.

GRAHAM LAWSON SHANKS, B.S.A.,
Instructor in Farm Mechanics.

EDWARD STANLEY HOPKINS, B.S.A.,
Instructor in English and Elementary Science.

Travelling Instructors

MISS M. M. GOLDIE, Instructor in Household Science.

MISS N. LAWSON, Assistant Instructor in Household Science.

H. S. PEARSON, Provincial Dairy Instructor.

G. W. SCOTT, Provincial Dairy Instructor.

A. W. FOLEY, Provincial Superintendent of Poultry.

DR. PERCY TALBOT, Provincial Veterinarian.



VERMILION

*E. A. Howes, Principal, School of Agriculture
L. Shanks, Instructor, Farm Mechanics
E. S. Hopkins, Instructor, Elementary Science*

*H. W. Scott, Mgr., Demonstration Farm
J. G. Taggart, Instructor, Animal Husbandry
G. W. Scott, Instructor, Farm Dairying*

SPECIAL LECTURERS

- (1) H. A. CRAIG, Superintendent of Demonstration Farms.
- (2) S. G. CARLYLE, Special Instructor in Dairy Farming.
- (3) W. F. STEVENS, Live Stock Commissioner.
- (4) C. P. MARKER, Provincial Dairy Commissioner.
- (5) ALEX. GALBRAITH, Special Lecturer on Horses.

EQUIPMENT AND FACILITIES

The school buildings are large and well lighted. Each contains two lecture rooms, Animal Husbandry room, Science room, Dairy, two Household Science rooms, besides a large assembly room, offices and library.

The stock for the work in Animal Husbandry is obtained from the adjoining demonstration farm or from local breeders, and at times some is shipped in for temporary use by the Department of Agriculture. The Science rooms are well stocked with all that is necessary for simple demonstrations and analyses. The Dairy rooms are fitted out with equipment for milk testing, for separating and for churning. All the leading firms have installed separators for the use of the students. The kitchens in the Household Science flats are equipped to handle twenty-four students each, at one time. The sewing rooms contain tables and sewing machines. There are also rooms furnished as dining rooms. Farm Mechanics is taught in



Teachers and Students only, Vermilion School of Agriculture



Class in Sewing with Miss Goldie in charge, School of Agriculture



A Class in Cooking with Miss Lawson in charge, School of Agriculture

a separate building of two storeys, having a carpenter shop upstairs and a blacksmith shop below. The former has twenty-four benches and full carpenter tool equipment, also a woodworker for general use. The blacksmith shop is furnished with eighteen forges and vises, with all the necessary tools for general blacksmithing.

HOUSEHOLD SCIENCE

This department deserves separate notice. It is the purpose of the Department of Agriculture hereafter to give the girls a course equalling in length that given to the boys. During the past term, however, the Household Science course lasted but two months at each school, beginning at Claresholm on November 28th and ending at Vermilion on April 30th. The work in each school has been under the supervision of Miss M. M. Goldie, a graduate of Macdonald Institute, Guelph. She has been assisted by Miss N. Lawson, a graduate of the State Normal College of Home Economics, Santa Barbara, California. The leading features of the work were sewing and cooking, but in addition, instruction was given in Hygiene, Sanitation and Home Care of the Sick. Lectures in gardening, poultry and home dairying were given by the respective teachers for the agricultural course.

ATTENDANCE

The aggregate attendance for the three schools was 166 boys and 102 girls, or a total of 268 students for the first year. Of the boys, probably about ten per cent. came from the local town and the remainder from a distance. Nearly all of the latter came from rural districts. In ages the range was from sixteen years to about thirty years, while in academic standing the range was from a few in the third form to a few who had actually taught school. It is the opinion of the principals that the age limit of fourteen years is too low—the students who made the greatest progress and gave the most satisfaction, being those who were in the twenties, young men with a purpose, who realized that they had a fine last opportunity and who were anxious to get as much as possible from the course. A few boys, a very few indeed, belonged to the derelict class, but while they did not constitute a source of much satisfaction, yet from the very interesting, practical nature of the work, they were obliged to leave the schools in better shape than when they entered. Perhaps the wholesome influence of contact with earnest fellow students was the chief factor in the improvement of more than one. In this connection it may be mentioned that the students of each school organized into a self governing body, forming its own constitution, drawing up most of the rules and regulations, conducting its own school functions and imposing all necessary punishments. The plan has been very satisfactory in each instance, and since a certain precedent has been established during this first year, and since the Student Council will be chosen chiefly from second year students next year, the system promises well for the future.



Students at Carpenter Work, School of Agriculture

Of the girls probably a larger percentage came from the local town, but it is a conservative estimate that sixty per cent. came from rural districts. The ages ranged from sixteen years up, and the differences in previous education were almost as marked as in the case of the boys. Some were married but most were still under twenty.

STUDENT ACTIVITIES

Debates.—As part of the work in English, debating was practised throughout the term, beginning with short debates during class periods and developing into more pretentious affairs that involved platform speaking before large audiences. The schools joined the High School Debating League, fostered by the Department of Extension of the University of Alberta and made a creditable showing in the inter-school contests—two of the Schools of Agriculture figured in the semi-finals.

Recreation.—As far as was consistent with good work in the general course the students were encouraged to engage in simple social functions. The reason for this is obvious—it is only lack of such experience that has made so many boys and girls appear backward when away from home, and indeed at home.

Athletics.—Good outdoor rinks were built and lighted so that the students had plenty of skating and hockey. When weather conditions permitted the boys played Association football.

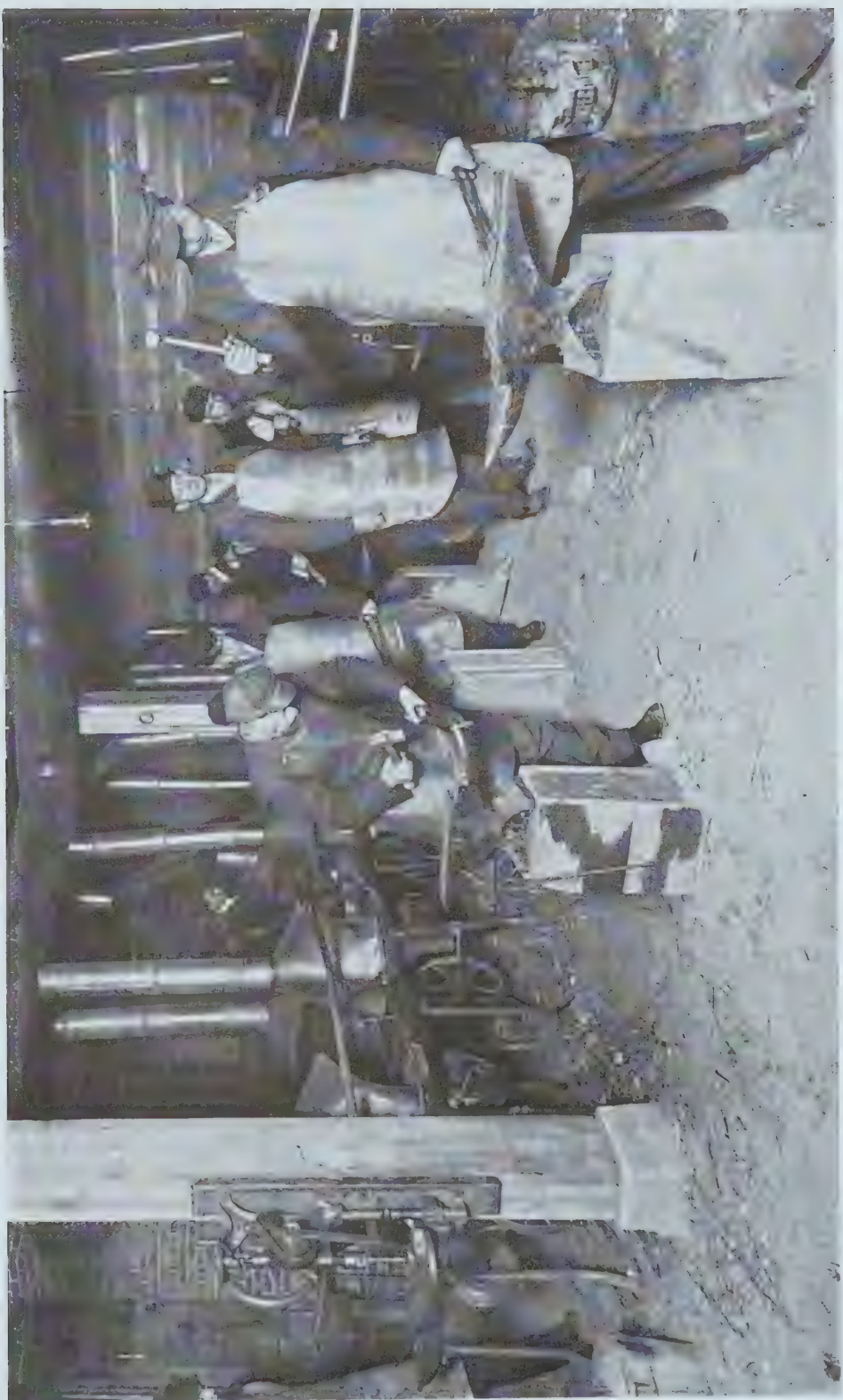
Class Spirit.—School colors, school pennants, school songs and yells evidenced the college spirit supposedly essential to proper organization in any educational institution.

EXTENSION WORK

The members of each staff remain at, or in touch with the school throughout the year. Their advice and assistance are at the service of any farmer in the respective territory tributary to each school. In addition to this, certain important features of extension work have already been inaugurated. The purpose of these is two-fold: First, to serve the farmers of Alberta; and second, by arousing interest and fostering co-operation in the work, to create a bond of sympathy between the agricultural community and the institution. The extension work is but a further step in bringing agricultural education closer to the homes of those engaged in the profession of Agriculture.

Dairy Competition

This competition is open to any student who has attended one of the Schools of Agriculture and to any farmer within a radius of twenty miles of one of these schools. Space will not permit detailed rules, but briefly the conditions are as follows:



Students at work in Blacksmith Shop, School of Agriculture

Any eligible competitor may enter any number of grade cows for a period not exceeding 240 days, between April 1st, 1914, and January 31st, 1915. Scales and record sheets are supplied by the Department of Agriculture. The Animal Husbandry instructor from each school visits each competitor in his district once every six weeks to inspect methods of feeding and handling, also to take samples of milk for subsequent test. Monthly record sheets are mailed to this inspector by each competitor. The final awards will be made on a basis of points given for pounds of butter fat and pounds of solids not fat. There are ten prizes offered, consisting of pure bred calves from dairy breeds, pigs and poultry. The competition is under the supervision of Mr. S. G. Carlyle, Special Instructor in Dairy Farming. Twenty-six students of last term have entered cows in this competition, and at time of writing about 130 competitors have been enrolled.

Co-operative Experiment

This work varies somewhat with the different schools. One may have too many irons in the fire, and it is quite possible to attempt too much in the way of co-operative experiment; therefore, each school has followed a line that best serves its respective portion of the province.

At one school the students have been organized into an Experimental Union, with a member of the school staff as a director. The boys who have joined the Union have clubbed together to purchase seed of certain varieties of the leading farm crops, and they are making comparative tests of these varieties in co-operation with similar tests made by the Agronomist at the local School of Agriculture. A summary of results furnished by members of this Union will be of great value to the work, will inculcate in the members the true experimental spirit, and will tend to greatly widen the school's circle of influence.

At another school co-operative experiments are being carried on with alfalfa. When the ranges are broken up into farms the production of fodder is of paramount importance. No better feed than alfalfa can be grown; but in many localities the growing of alfalfa is still problematical, hence co-operative experiments aiming to ascertain the best methods and conditions for successful alfalfa production represent a splendid means for service by a School of Agriculture.

One of the schools is working in co-operation with two demonstration farms and with nine farmers, representing local Agricultural Societies, in a series of potato tests, leading to the establishment of Potato Growers' Associations. On each demonstration farm one-third of an acre is grown of each of nine chosen varieties of potatoes. The farmers are growing the same varieties. After harvesting the crops, an exhibition of representative samples will be put on by the local Agricultural Society, and a cooking demonstration given. A committee of buyers will be asked to decide as to the best variety, and following this, an attempt will be made to pledge



A Class in Stock Judging, School of Agriculture

members of the prospective associations to grow only that variety. The aim is to secure the production of potatoes uniform as to variety and grade, and to produce them in car-load lots.

The Schools of Agriculture aim to co-operate with, and to aid, as far as possible, the Department of Education in its campaign to foster the teaching of Agriculture in the Public and High Schools. Members of the staff are at the service of school teachers in the matter of establishing school or home gardens for the children. Some of the members of the Schools' staff are to assist in the teaching of agriculture in the Summer School for Teachers at the University of Alberta. It will be seen that this help given is not altogether disinterested, because, from the schools of the Province must come the future students in the Schools of Agriculture.

At each school a seed germinator has been installed and farmers and dealers are sending in samples of seed to be tested as to vitality. This work was begun during the winter and the students aided in the tests, counting the seeds and making out the reports. It is the wish of the Department that the schools test all seed samples submitted and to report upon the same, and for this purpose they have been supplied by the Department with report and record blanks.

In addition to the foregoing the members of the Schools' staff are ready to visit farmers on request and to aid in any manner desired. They assist in Farmers' Institutes and short courses when required, and will also act as judges at seed and fall fairs.

Experiment and Research

Twenty acres of the neighbouring demonstration farm have been set aside for each school for the purpose of field experiment. These experiments will, of course, vary according to the location of the school but a general list of experiments proposed for this summer may be given:

- (a) Grasses—Plots of a dozen or more of the leading grasses.
- (b) Clovers—Medium, Mammoth and Alsike.
- (c) Alfalfa—Strains, methods of culture.
- (d) Grain Crops—Comparative tests of varieties of wheat, oats, barley and peas.
- (e) Demonstration—(Unusual crops), Emmer, Spelt, Vetch, Einkorn, Feterita, Shallu, Milo Maize, etc.
- (f) Millets—Comparative variety tests.
- (g) Potatoes and Field Roots—Comparative variety tests.
- (h) Culture tests—Depth of seeding; thickness of seeding; dates of seeding; frequency of cultivation.
- (i) Inoculation—Peas, Alfalfa, Red Clover, and Alsike.
- (j) Horticulture—Small fruits, vegetables; comparative variety tests.



A Class in Farm Machinery, School of Agriculture

An interesting feature in the field of experiment is the work in connection with ornamental tree planting and with small fruits. There is a splendid opportunity for service in this direction. A great many families, now settled in Alberta, have come from eastern homes where ornamental trees grew almost as a matter of course. It is, therefore, a subject of considerable interest—what trees will grow by transplanting in Alberta, and what varieties will do best. Of more immediate importance, perhaps is the question of small fruits, particularly the comparative adaptability of varieties. The schools are making a fair start in attempting to solve these problems. Special attention this year is being paid to small fruits, but some tree planting also has been attempted. Definite conclusions cannot be expected from one year's work but great interest is being shown already in the work undertaken.

Plots will be larger than those usually found on experimental areas, but as the number of experiments increases each year, the size of the plot may be decreased. On first acquaintance, farmers have greatest respect for the large plot. It will be noticed that the work undertaken is almost as much demonstration as it is experiment. Arrangements will be made to allow students to visit the plots during the summer.

At one of the schools experiments in stock feeding are being conducted.

At each school the instructor in Elementary Science is undertaking some form of research work, such as soil and fodder analyses or temperature and moisture tests. He is also experimenting with the methods of destroying gophers—particularly by the disease inoculation method, with cultures furnished by the Department of Agriculture. One instructor is specializing in legume cultures which he is furnishing to the schools for the inoculation experiments mentioned in a previous paragraph.

Promotion

A very large percentage of the students of last term will return for the work of the second year. This work will be an extension and amplification of what was given during the first year. Promotion from first year to second was based 40% upon a final examination and 60% on term work. At the end of the second year it is purposed to submit the second year students to a more strict examination. Students who reach a specified standing will receive an Associate diploma.

Conclusion

That the Schools have been a success to date is generally acknowledged throughout the Province. The attendance was considerably larger than most people expected. The opportunity for an agricultural education was embraced by many who would not have considered attending a larger institution. No one will contend that a central college would have enrolled 268 students during its first term; one-fourth of that number would be nearer



Students engaged in Weed Seed Identification, School of Agriculture



Students at work in Chemical Laboratory, School of Agriculture

probability. The contention is that the Schools of Agriculture as now established, meet a want not satisfied by the regular college—the necessity for education nearer home, at less expense and amid more familiar surroundings. There is no tuition fee in connection with these schools; the student is at the expense of board, lodging and books only. The latter will cost no more than ten dollars each term, and board and lodging in town will call for about one hundred and twenty-five dollars, and the schools are open at a time when there is least work to do at home. At one of the schools a large percentage of the students belonged to the homesteader class, young men who preferred to work their claims during the summer and to study during the winter. Needless to say these young men were banner students, and they return to their farms well pleased with the sacrifice of time and money. In conclusion it may be said that if the approbation of the students who have attended, the satisfaction expressed by the members of the Schools' staff, and the kindly words of praise and encouragement from outsiders who are in a position to understand, constitute evidence of success, the Department of Agriculture has every reason to feel well satisfied with the outcome of the work of the first year in the Provincial Schools of Agriculture.



Index

	PAGE
Agricultural Education in Alberta	3
<i>By Hon. Duncan Marshall, Minister of Agriculture.</i>	
Buying a Dairy Cow	9
<i>By H. A. Craig, Superintendent of Demonstration Farms.</i>	
Feeding of Dairy Cattle	13
<i>By S. G. Carlyle, Special Instructor in Dairy Farming.</i>	
Feeding Cows for a Seven Days' Record	17
<i>By S. G. Carlyle.</i>	
Results of Dairy Tests	19
<i>By S. G. Carlyle.</i>	
Care of Milk on the Farm	21
<i>By S. G. Carlyle.</i>	
Building Up a Dairy Shorthorn Herd	23
<i>By H. A. Craig.</i>	
Steer Feeding	31
<i>By H. A. Craig.</i>	
Sheep	37
<i>By W. J. Elliott, Principal of Olds School of Agriculture.</i>	
The Breeding and Rearing of Hogs	40
<i>By H. A. Craig.</i>	
Farm Poultry Raising	43
<i>By H. W. Scott, Manager of Vermilion Demonstration Farm.</i>	
Growing of Corn	46
<i>By H. A. Craig.</i>	
Alfalfa in Alberta	50
<i>By H. A. Craig.</i>	
Financial Statement	51
Rotation of Crops	53
<i>By F. S. Grisdale, Agronomist, Olds School of Agriculture.</i>	
The Importance of Moisture Conservation	55
<i>By Geo. Harcourt, Deputy Minister of Agriculture.</i>	
Seed Vitality	59
<i>By E. A. Howes, Principal of Vermilion School of Agriculture.</i>	
Alberta Schools of Agriculture	63

